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# East Europe Report

ECONOMIC AND INDUSTRIAL AFFAIRS

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30 January 1984

## EAST EUROPE REPORT

### ECONOMIC AND INDUSTRIAL AFFAIRS

#### CONTENTS

##### BULGARIA

- Growing Use, Production of Ferrous Metals Impede Economy  
(Yordan Dimitrov, Todor Kunchev; PLANOVO STOPANSTVO,  
No 10, 1983) ..... 1

##### CZECHOSLOVAKIA

- Grain Programs for 1983-1984 Examined  
(PRAVDA, 14 Dec 83) ..... 13
- West Slovakia, by Ivan Znasik  
Central Slovakia, by Peter Valent  
East Slovakia, by Martin Tukot
- Decree on Working Saturdays in 1984, 1985 Published  
(SBIRKA ZAKONU, No 27, 1983) ..... 18
- Experiment in Pay According To Work Described  
(Jana Hajkova; SVET PRACE, No 20, 1983) ..... 21
- Transportation Rates Restructured After January 1984  
(Jozef Hanulik; HOSPODARSKE NOVINY, 2 Dec 83) ..... 25

##### GERMAN DEMOCRATIC REPUBLIC

- Increase in Use, Collection of Secondary Raw Materials  
(Hans-Joachim Schmidt; PRESSE-INFORMATIONEN, No 144,  
9 Dec 83) ..... 32

##### HUNGARY

- Council Notes Troubled Year for Agricultural Co-Ops  
(NEPSZABADSAG, 22 Dec 83) ..... 35

National Highway System Described (I. Banozcy, L. Szecsi; ZEITSCHRIFT DER OSSHD, No 5, 1983)	36
ROMANIA	
Inadequate Fire Protection Measures in Buildings (Ionel Savu; PAZA CONTRA INCENDIILOR, Nov 83)	45
YUGOSLAVIA	
Status of Maritime Fleet Outlined (EKONOMSKA POLITIKA, 28 Nov 83)	49
ERRATUM: Macedonian Power Problems, Restrictions Reported (BORBA, 25 Nov 83)	55

GROWING USE, PRODUCTION OF FERROUS METALS IMPEDE ECONOMY

Sofia PLANOVO STOPANSTVO in Bulgarian No 10, 1983 pp 13-25

[Article by Yordan Dimitrov, candidate of technical sciences, and Todor Kunchev, candidate of economic sciences: "Factors Affecting World Trend towards Reduction of Ferrous-Metal Consumption and Certain Conclusions for our Country"; passages enclosed in slantlines printed in boldface]

[Text] Problems in metal production and consumption are not new, but their urgency is increasing with the expanding global crisis. They are especially important now for our country which is poor in sources of raw materials. Therefore the article\* by P. Pavlov, doctor of economic sciences, examining world trends in ferrous-metal consumption, arouses considerable interest among executives and specialists. It analyzes statistical data on world steel production and consumption during the 20-year period from 1961 to 1980. The article points out the trend towards a decline in average annual growth of production during the period from 1961 to 1965 and towards a decline in the visible consumption (production plus imports minus exports) of steel per capita from 162 kg in 1970 to 155 kg in 1980.

In contrast to the world trend, the visible per-capita steel consumption in our country grew, and at a high rate at that, from 98 kg in 1960 to 262 in 1970 and to 529 kg in 1980. In consequence, the ratio between the average annual growth of visible steel consumption and of our national income during the 1976-1980 period is unfavorable--about 1.1 in comparison with the world average of 0.5 and under 1 for almost all industrially developed countries. These figures show that there is a trend in our country towards the metal-intensive development of certain sectors due to structural improvements in machine building.

P. Pavlov's article has unquestionable merits, but it does not fully delineate the main point; not all the factors affecting the decline of world ferrous-metal consumption are brought out and analyzed. In the attempt to analyze certain factors, P. Pavlov writes, "Of great importance for the lowering of the average annual rate of steel production during the past decade is the /energy crisis/ in the capitalist countries, which began in 1974 and is continuing at the

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\*P. Pavlov, "Changes in Ferrous-Metal Production and Consumption--World Trends and Certain Conclusions for Our Country," in the journal PLANOVO STOPANSTVO [Planned Economy], 1983, No 4.

present moment, and accordingly the lowering of the rate of their economic development. The energy crisis has had an adverse, albeit partial, impact on the economic development of the socialist CEMA-member countries as well" (page 41, our emphasis--authors' note).

The proposition that the energy crisis in the capitalist countries and the lessened rate of their economic development alone are factors explaining the trend towards a decline in the rate of steel production and consumption, in our opinion, is erroneous and unfounded because it cannot provide an answer to several questions.

/First/, why do the statistical data not substantiate serious crisis phenomena (stagnation, a decline) in world energy production and energy sources after 1974? Moreover, in 1981 as compared with 1975, there was an increase in electric power production from 6,495,000,000,000 to 8,134,000,000,000 kilowatt-hours (26 percent); of bituminous, semibituminous and anthracite coal from 2,358,000,000 to 2,775,000,000 tons (16 percent); of lignite and brown coal from 863,000,000 to 1,007,000,000 tons (24 percent); and of crude oil from 2,646,000,000 to 3,123,000,000 tons in 1979 (18 percent). At the same time, iron ore production declined from 562,000,000 tons in 1975 to 496,000,000 tons in 1980 (about 6 percent).<sup>1</sup>

/Second/, why did the decline in the rate of steel production begin long before the energy crisis of 1974--from 6.3 percent in 1961-1965 to 5.6 percent in 1966-1970 and 1.6 percent in 1971-1975?

/Third/, why did the greatest capitalist country, the United States, in 1980 have an increased, rather than a reduced, growth of industrial production as against 1970? Despite this, U.S. per-capita steel consumption declined from 547 kg in 1975 to 508 kg in 1980 (about 7 percent).

/Fourth/, why did our metal consumption grow despite the fact that our country is poor in energy resources?

/Fifth/, how are we to explain the lowest steel consumption among the socialist countries in the Hungarian People's Republic--330 kg per capita in 1980, where machine building's share of the structure of industry is 30.6 percent, as against 22.7 percent in our country?

Clearly the energy crisis alone cannot explain the decline in world ferrous-metal production and consumption. Quite different factors cause this trend, which will continue in both this and the next decade regardless of whether there is an energy crisis or not.

What are these factors?

The rapid development of technical progress during the second half of our century has given rise to two opposed trends: towards an increase in metal needs and towards a decrease thereof. The first was caused by the creation of an ever wider diversity of technical facilities (machinery, equipment, tools, apparatuses etc.), replacing human physical and mental labor. At the same time,

for about 10 years there has also been a trend towards a decline in world metal consumption. Is a technical retrogression emerging? No! Technical progress is unfolding at an ever higher rate, but at a certain stage new achievements lead to a decline in metal needs.

Making no claim to complete exhaustiveness, we shall attempt to clarify how this happens.

The trend towards a decline in metal needs is affected by a number of factors in technical progress which can be divided into two main groups: factors resulting in a decline in metal consumption through a lowering of the needs for machines, and factors resulting in a decline of metal consumption through a reduction of metal input in the designing and production of machines.

The first group is affected by the following factors.

/Automation of machines./ During the past decade the proportion of low-efficiency nonautomated machines has appreciably declined and continues to decline in favor of semiautomatic devices, automatic machines and automation lines. In efficiency, a semiautomatic lathe, for example, replaces two to three general-purpose manually controlled lathes, while an automatic lathe replaces five to six and in some cases up to 20-25. The situation is analogous in the case of milling, polishing, and forging and pressing machines, in the case of looms and the other groups of production machines in industry. Automation has led to a considerable decline in the number of machines with which the stock of machines is reproduced and expanded, and hence to a reduction in metal consumption for machine production. Thus, for example, by virtue of the automation of machines in CEMA-member countries there was a decline in 1981 as against 1975 in the production of metal-cutting machines from 371,000 to 342,000; of spinning machines\* from 7,950 to 6,830; of looms\* from 43,360 to 38,280<sup>2</sup> etc.

Under this factor we must also include the /modernization/ of obsolete machines, now assuming ever broader proportions, whereby productivity is significantly increased and the needs for new machines--and hence of metals--decreased with comparatively small quantities of metal (automating devices).

/Lengthening the life of machines./ In the past decade a number of new technical solutions in machine production, such as increasing the class of precision and roughness in the working of surfaces, increasing hardness through thermal and other treatment of surfaces, protecting metals against corrosion, etc., have resulted in a growth in the reliability of machines and a lengthening of their life. Thus, for example, the proportion (by quantity) of the manufacturing equipment in machine building over 20 years of age is 34 percent in the United States, 27 percent in the FRG, 24 percent in Great Britain etc. The average age of the manufacturing equipment in machine building runs from 10-11 years in the United States and France to about 14 years, and in the FRG, Canada, Italy and Great Britain to about 13 years.<sup>3</sup>

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\*The Socialist Republic of Romania excluded.

/Increasing the use of machines./ The rise in the shift index and in the use of machine operating time is a trend which appeared in the past decade in all industrially developed countries. It was caused by a number of factors, chief among which was the putting into operation of considerably more expensive and automated machines. As a result of the stepped-up utilization of production capacities, there has been a decline in the need for new machines for the reproduction and expansion of the stock of manufacturing machinery and, accordingly, in metal consumption as well.

The trend towards a decline in metal consumption by virtue of the decreasing of metal input in machine design and production is affected by the following factors.

/Improving the type of machine./ At the end of the 1950's and the beginning of the 1960's Soviet investigators<sup>4</sup> found that the metal-working machines put into operation were parametrically significantly overdimensioned above rationally permissible values. Thus, for example, the coefficient of parametric use of lathes was about 0.30 to 0.40. Because of this, the type of machine was improved by shifting to the design and production of smaller-sized machines. The coefficient of parametric use of machines was raised to about 0.70-0.85, which resulted in a decrease of metal consumption in producing the machines.

/Employing plastics in machine building./ During the second half of our century, plastics and other nonmetallic materials underwent rapid development and wide application in machine building. Plastics with high strength characteristics were created that compete successfully with metals in a number of parts. In combination with metal reinforcement, by now they have replaced a significant portion of the metal in bearing structures. Plastics have also had wide application in items of household machine-building (electric household appliances, recreational electronics, pipe reinforcement etc.).

/Creating high-strength metal alloys./ The development of metallography and metallurgy has resulted in the creation of new metal alloys with high strength characteristics. Preconditions have appeared for reducing the size of parts. New scaled-down and weight-reduced machine designs have been created that stand up under the same workloads with less metal input.

/Product minimization./ As a result of the development of design thinking, fundamentally new design solutions for individual parts, assemblies and products requiring less metal have appeared. Heavy mechanical drives in machines have been replaced with considerably lighter pneumatic, hydraulic and electric drives. A trend has appeared towards product minimization--the achievement of specific production characteristics with the least metal input. Examples along these lines are the weight reduction of electric motors and internal combustion engines with no modification of power, the replacement of mechanical calculating machines with electronic calculators, the replacement of old electronic computers with newer generations etc. The employment of electronic computers in machine design will also increasingly have a strong influence on product minimization. Preconditions have been created for rapid, precise and multivariant design calculations and for machine workload modeling, which results in the optimization of the size of parts. In the place of the old outsized and heavy designs, new elegant machines requiring less metal have appeared.



/Product maximization./ Another trend which has resulted in the relative decline of metal needs is product maximization. A tendency has developed towards the creation of ever larger-sized machines--cranes, trucks, turbines, aircraft and helicopters, tankers etc., with a greater amount of work achieved per unit of metal. In almost all industrially developed countries a new machine-building subsector--heavy investments machine-building--has appeared, thus exerting an ever greater influence on the reduction of metal consumption.

/Employing zero-waste technologies./ In the past 2 decades there has been a rapid development of many new progressive metalworking technologies such as precision casting, powder metallurgy, precision forging and stamping, cold rolling of parts etc. As a result the coefficient of metal utilization has risen from 0.50 to 0.70-0.80. This has led to a reduction of metal losses during machine production and of losses from corrosion.

/Reclaiming metal resources./ The trend towards a decline in the rate of ore extraction and metal production has also been increasingly affected by the development of technologies for the reclamation of metal resources. Worn-out parts and scrapped obsolete and physically antiquated products have been turned from useless waste into an important reserve for the development of machine building in all industrial countries.

The relative significance of the factors of technical progress for the trend towards a reduction of metal production and consumption varies for different periods and countries. It is dependent on the degree of development of the individual factor, the state of the economy of the given country, the structure of machine-building subsectors, series production etc. An approximate estimate of the influence of the factors of technical progress on metal consumption is given in Table 1.

The overall influence of these factors, which arose as a result of the accelerated development of technical progress and not of the energy crisis in the capitalist countries and the reduced rates of their economic development, as P. Pavlov writes, has led to a /favorable trend/ towards a reduction in the world consumption of ferrous metals. As a result of the accelerated development of technical progress, production sectors have been saturated with machinery and the needs for machines and metal consumption have been reduced. The trend towards the saturation of the home with household electrical appliances and recreational electronics in the most developed countries, which likewise affects the decline in world metal consumption, has been correctly appraised in our country in another published article<sup>5</sup> on the problems in ferrous metals.

It is not high metal consumption, but /the high-science character/, i.e. the high price per kilogram of machine-building output, that is one of the main criteria for the development of technical progress. Far-seeing researchers have long since ceased to measure economic development by the production and consumption of ferrous metals.

Before we analyze the problems of metal consumption in our country in the light of technical progress, one more factor--the foreign trade in machines--has to be considered. Strictly speaking, it does not substantially affect the world

trend, but at the same time it leads to an appreciable reduction of metal consumption in the developed capitalist countries at the expense of the developing countries. This gives us grounds for calling it /a strategic factor/.

Table 1

ESTIMATE OF INFLUENCE OF FACTORS OF TECHNICAL PROGRESS  
ON REDUCTION OF METAL CONSUMPTION

No.	Designation	Relative influence %
1.	Automation of machines	45
2.	Lengthening machine life	5
3.	Increasing the use of machines	5
4.	Improving the type of machines	15
5.	Employing plastics in machine building	5
6.	Creating high-strength metal alloys	5
7.	Product minimization	5
8.	Product maximization	5
9.	Employing zero-waste technologies	5
10.	Reclaiming metal resources	5
Total:		100

What is the essence of it?

Nonautomated, low-efficiency (metal-intensive and low-science) machines, which have comparatively low prices per kilogram, will be used for many years yet in single-unit production and on repair jobs. Their share (costwise) of the total need of machines for industry is about 20 to 30 percent. The most developed capitalist countries (the United States, Great Britain, the FRG, France etc.) in recent decades have "surrendered" (through the sale of licenses) the production of a great part of these machines to the developing countries. By virtue of this they have increased their production of high-science products with comparatively low metal-intensiveness and high per-kilogram prices. In consequence, in return for exports of expensive radar and radio equipment and other high-science machinery, the United States, for example, annually procures from China 10,000 to 15,000 cheap nonautomated metal-cutting machines at a cost of about \$80 million. In return for the export of a Rank-Xerox model copying machine weighing about 500 kg and priced at about \$60,000, Great Britain imports 10 general-purpose lathes, each weighing about 2000 kg, at a price of \$6000, half of which is for 20 tons of metal. This "metal operation" brings the developed capitalist countries an economic advantage in many ways, chief of which is the sharp reduction of metal consumption. That is why visible per-capita steel consumption, according to the data calculated by P. Pavlov (page 44), fell in the United States in 1980, as compared with 1970, from 620 to 508 kg (22 percent); in Great Britain from 458 to 247 kg (46 percent); in France from 457 to 373 kg (18 percent) etc.

The strategic factor brings an economic advantage to the developed capitalist countries besides from the sale of licenses (for obsolete products), from the reduction of energy inputs into metallurgy, from the reduction of the relative significance of jobs at hard unattractive labor in metallurgy etc. The "surrender" of the production of cheap metal-intensive products to the developing countries is a strategic operation of capitalism, which at bottom is a new covert form of exploitation of the developing countries. The leading position at present held by the most developed capitalist countries in labor productivity, return on capital and per-capita income is also due in great measure to this strategic course.

Why then, given a world trend towards a reduction of ferrous-metal consumption, does consumption still continue to increase in certain subsectors in our country? Why is our per-capita ferrous-metal consumption higher than that of the United States, Great Britain, France, the Hungarian People's Republic and other countries? Why the metal-intensive development of our economy? In our opinion, this is due to several basic causes.

/First/, the factors of technical progress have still not reached a degree of development in our country that guarantees a reduction of metal consumption. The status of two structure-determining factors--the automation and type of machines--is especially unfavorable. Thus, for example, the share<sup>6</sup> (by quantity), represented by turning and polishing semiautomatic devices and automatic machines, of the structure of metal-cutting machines produced in our country in 1981 was 3 percent, as against 16 percent in the Hungarian People's Republic and the Czechoslovak Socialist Republic, 21 percent in the GDR etc. According to the most optimistic estimates, the share represented by automatic machines and semiautomatic devices in the structure of the equipment park of our machine building is about 30 percent, which includes only about 5 percent of domestic make, as against 50 to 60 percent in the advanced countries, which includes 30 to 40 percent of domestic make. Whereas, for example, in the Hungarian People's Republic the production of (metal-intensive) metal-cutting machines declined from 14,500 in 1970 to 10,200 in 1980 (30 percent), in our country it increased during the same period from 13,900 to 18,900 (36 percent). The product line turned out by our machine-building industry continues to be updated with cheap metal-intensive products, which causes high metal consumption and the trend towards metal-intensive development of the economy.

The state of affairs in respect of the second structure-determining factor--type of machines--is no better. Investigations<sup>7</sup> made in this area prove that the coefficient of parametric use of machines in our industry is 0.53, as against 0.70-0.85 in the advanced countries. Very often we continue to design and produce larger-sized machines than rationally necessary for our conditions. Thus, for example, the above-indicated basic parameter (maximum machinable diameter) of the lathes produced in our country in 1979-1980 was 468 mm, as against 233 mm in the USSR, 324 mm in the GDR, 285 mm in the Czechoslovak Socialist Republic, 330 in the Polish People's Republic, 378 mm in the Hungarian People's Republic, 340 mm in the Socialist Republic of Romania, 278 mm of the Weiler firm in the FRG in 1974 and 266 mm in 1980-1981.<sup>8</sup>

The general status in our country of the other eight factors of technical progress affecting the reduction of metal consumption is comparatively better. In the case of some factors such as lengthening of machine life, employment of plastics and high-strength alloys in machine building, the results do not differ substantially from the achievements of the advanced countries. The level is comparatively lower in the case of product minimization and the reclamation of metal resources. The use of machines and the employment of zero-waste technologies in machine building are unsatisfactory and far below the world level. Thus the relative significance of the influence of these factors is comparatively less--5 percent for each and 40 percent in toto, and even in the event of their best development in our country they will not result in a reduction of the structure-determining factors--automation and type of machines.

If the influence of the 10 factors of technical progress on the reduction of ferrous-metal consumption is estimated to have a total worldwide index of 100, then this index for our country is considerably lower--about 40. The unsatisfactory state of the factors of technical progress in our country causes high metal consumption and the metal-intensive development of our economy.

/Second/, the strategic factor also has a certain influence on our high metal consumption. What is the problem here?

Our country participates actively in the international division of labor. Machine-building output's share of our foreign trade is about 46 percent. Therefore the problem lies in the character of the exchange of machine-building products. As has already been indicated, we produce for the most part nonautomated metal-intensive products. The average price per kilogram of the machines we export is about 3 to 5 leva (dollars), as against \$10 to \$15 (or more) for the machines we import. The physical balance in our foreign trade in machines is on the debit side since we compensate for the import of 1 ton of expensive automated machines by the export of about 3 tons of cheap metal-intensive machines. We export cheap metal-cutting machines, for example, to such industrially developed countries as Italy and the FRG, to which in 1981 we sold respectively 777 and 444 lathes,<sup>9</sup> for the most part general-purpose and nonautomated.

The strategic factor affects the increase of ferrous-metal consumption in our country as well as in the developing countries, but to a lesser extent since our trade with the developed capitalist countries was comparatively less (16.7 percent) in 1981, including 13.4 percent exports and 20 percent imports.<sup>10</sup> The negative effect of the strategic factor to a certain extent impedes the positive impact of the factors of technical progress on the reduction of our ferrous-metal consumption.

/Third/, when we analyze the problem in metal consumption, we should not overlook the negative influence of /the subjective factor/ in this area, either. The unsatisfactory state of the two structure-determining factors of technical progress on the reduction of metal consumption--automation and type of machine--is, first and foremost, a subjective problem for our country. For many years we have pursued a policy of metal-intensive, rather than metal-saving,

development of machine building. We have fallen into the trap of "capturing" the world markets in nonautomated metal-intensive products as, for example, in metal-cutting machines. Not until recent years, when we had already exhausted our own metal resources and metal raw materials in the world markets had risen in price, did we attempt--very late--to change our machine building over to the production of automated machines with high prices per kilogram.

The state of affairs is analogous in the case of machine type, too. Mainly for subjective reasons we continue to produce outsized metal-cutting machines, the type of which satisfies barely 20 percent of our domestic type-size needs.

The trend towards an increase in ferrous-metal consumption has led to certain adverse phenomena in the development of our economy. Since our country is poor in mineral resources, we have been obliged to increase our ore and metal imports which, on the one hand, makes the development of our economy increasingly dependent on the international raw-materials markets and, on the other, reduces the possibilities of importing foodstuffs and industrial household products. Thus, for example, in 1981 as compared with 1970 there was an increase in the imports of iron ore from 1,133,000 to 2,280,000 tons, of cast iron from 295,000 to 435,000 tons, of rolled ferrous metals from 1,009,000 to 1,831,000 tons and of a number of other raw materials and metals, while imports of certain household goods declined.

Our ferrous-metal resources are declining sharply. The extraction of iron ores (in physical terms, including iron scoria) has declined 40 percent in recent years. Unless the trend towards an increase in our ferrous-metal consumption is overcome, difficulties may be created in the development of the economy.

Let us return to P. Pavlov's article. It concludes by asking the question: "/The question of the directions to be taken for the development/ of ferrous metallurgy and ferrous-metal consumption in the Bulgarian People's Republic in the future arises once more now with still greater acuteness. /In what way is it advisable for them to develop/: by intensification of production and lowering of ferrous-metal consumption per unit of national income, which is being done in the industrially developed countries mainly by modernization and elevation of the technical level, /or/ (!) by mainly extensive development of ferrous metallurgy and a rise in the metal-intensiveness of national income in the country?" (page 50, emphasis and exclamation point ours, authors' note).

The answer to this question has long since been given by practical experience--/the advisability of intensive/ development of the economy is beyond doubt. Asking it in the article sounds more like criticism of the unsatisfactory state of affairs in this area in our country and like a pious wish for the intensive development of our economy. The article does not indicate, however, how this is to be done.

Also debatable is P. Pavlov's proposition about "the reconstruction and modernization" (page 49) of our metallurgical capacities being a factor in ". . . lowering metal-intensiveness and raising the efficiency of ferrous-metal consumption and exports. . ." (page 50). It is correct for countries with a

developed metallurgy that have abundant mineral resources, but for our country it will probably be economically more advantageous to buy from the USSR and other countries a limited quantity of rolled ferrous metals that are considerably higher in assortment and quality than the capabilities of our ferrous metallurgy. It is not reconstruction and modernization, but the gradual abandonment of obsolete metallurgical capacities that needs to be done in our country. Instead of investing vast sums once more to develop metallurgical capacities, it will be more advisable to reduce our metal consumption to the level of the countries that are advanced in this area--this is the right decision, which will bring an economic effect for our country.

What are the ways of reducing our ferrous-metal consumption?

To overcome the negative trend towards an increase in ferrous-metal consumption and to make the transition from metal-intensive to metal-economizing development of our economy, effective measures must, in our opinion, be taken in the following directions.

/First, the product line of our machine building must be improved/ by sharply increasing the proportion of semiautomatic devices, automatic machines and automation lines through a reduction in the production of nonautomated machines. For this purpose the following must be done:

reduce the production of metal-intensive products which have comparatively low prices per kilogram, the volume gradually being restricted to satisfy domestic needs. This applies to general-purpose metal-cutting and forging-and-pressing machines, agricultural machines, crane designs, freight cars, some of the older models of battery-operated and engine trucks etc. The demand for these products in the international markets must not be a factor (as hitherto) causing an expansion of their production in our country;

expand the production of products with medium--and especially those with high--prices per kilogram, such as /electrical products/ (electric motors, electrophers, transformers, starters, relays, electric display boards); /electronic equipment/ (electronic computers, peripheral equipment, recreational electronics); /hydraulic and pneumatic/ instruments and apparatuses; /metalworking/ automatic machines and semiautomatic devices; /household equipment/ (refrigerators, washing machines, electric appliances, metal siding) etc. The advisability of this measure is due, on the one hand, to the fact that our country has already accumulated a great deal of experience in developing and mastering designs and technologies for the production of the products and, on the other, to the availability of domestic raw-material sources (nonferrous ores) needed for their production;

master the production of new high-science products with high technical and operational characteristics and high per-kilogram prices, such as /specialized machine tools/ (electrophysical and electrochemical); /high-precision/ turning, milling, polishing and punching-and boring machines; /copying and microfilm/ equipment; /laser/ equipment; /space/ apparatuses; /laboratory/ equipment; /household/ equipment (freezers, dishwashers, microwave ovens) etc.

/Second, the type of machines produced in our country must be improved/ with new small-sized models suitable in type size for our production conditions. There is already experience and known results in this area. The discontinuance of the production of the inadequately-suited-for-our-conditions model SE-062 320-mm lathe with TsPU [digital program control] (the well-known "Perun") and its replacement with the optimal-for-our-conditions model SP-161 160-mm lathe with TsPU have already had an effect. The metal-intensiveness of the SP-161 lathes is 1.5 times less than that of the SE-062 lathe.

/Third, preconditions must be created for accelerating the development of the other eight factors of technical progress/ that affect the reduction of metal consumption. Attention must be focused here mainly on the rapid introduction of zero-waste and low-waste technologies of materials processing. The coefficient of use of metals in our country is still unsatisfactory--0.60-0.65 as against 0.70-0.80 in the advanced countries. The problems of machine utilization must also be rapidly solved. The data which have been published in our statistics regarding comparatively high shift indices and coefficients of use of machine operating time must not make us rest content. They apply to about 40 to 50 percent of machine building's stock of machines included in KESSI's [Committee on Integrated Social Information System] observations and reports. Our industry has many machines that are redundant, inoperative and rarely operative--a few hours per week or per month (the so-called "technologically necessary machines"). The full two-shift machine operating system and the three-shift system for the most expensive machines plus the full 7-day work week of rotating shifts with specific economic incentives for workers are a great potential reserve for reducing the needs for machines and metal consumption.

Therefore it is an urgent duty of executives and specialists to find a new approach to the investigation and solution of the problems of metal consumption in our country and to bring about conditions in the near future for our measuring up to the countries that are advanced in this area.

#### FOOTNOTES

1. "Statisticheski Godishnik na NRB" [Statistical Yearbook of the Bulgarian People's Republic], Sofia, KESSI, 1982, pp 631-638.
2. "Statisticheskiy Yezhegodnik Stran-Chlenov SEV" [Statistical Yearbook of CEMA-Member Countries], Moscow, Finansy i Statistika, 1982, pp 76 and 78.
3. "Album Tabulogrami s Analiz na Strukturata na Tekhnologicheskoto Oborudvane na Mashinostroeneto" [Album of Tabulated Forms with Analysis of the Equipment Park of Machine Building], Sofia, TsMI [expansion unknown], 1980, p 29.
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CSO: 2200/64



GRAIN PROGRAMS FOR 1983-1984 EXAMINED

West Slovakia

Bratislava PRAVDA in Slovak 14 Dec 83 p 3

[Article by Ivan Znasik, department head, CPSL committee for the West Slovakia kraj]

[Text] Unmistakable evidence of the determined effort of farmers in the West Slovakia kraj to make an appropriate contribution to the gradual self-sufficiency in food production is their long-term socialist pledge that among other things they will create conditions in the kraj for producing 2,500,000 tons of grain annually during the Seventh 5-Year Plan. This effort is headed and the pledges for the fulfillment of the grain-growing program are most successfully honored by the "60-ers"---members of the movement which was born in our kraj at the initiative of the West Slovakia kraj CPSL committee and PRAVDA editorial board in honor of the 60th anniversary of the Great October Socialist Revolution. The goal of this movement is, on the basis of the latest scientific findings and progressive experiences, to make full use of the biological potential of highly efficient Soviet species and Czechoslovak wheat varieties bred on their basis for increasingly larger grain crops.

Although due to unfavorable weather in the first 2 years of the Seventh 5-Year Plan we could not keep our word completely, we achieved results which are in terms of our pledge so to say within reach. Many enterprises in fact substantially surpassed their share in the total commitment. Specifically by producing 1,835,115 tons of grain, the socialist sector fulfilled the production plan for densely sown grain by 104.7 percent and 81,909 tons of grains above the plan were harvested in the kraj. The Nitra and Nove Zamky okreses made the biggest contribution to surpassing the planned harvest of densely sown grains. Moreover, all okreses surpassed the planned targets. The average yield per hectare in the kraj was 5.22 tons of grain, but two enterprises--the Agro-complex national enterprise at Calov and the Seed Handling State Farm national enterprise at Calov and the Seed Handling State Farm national enterprise at Kvestoslavov--achieved a yield of 7 tons of densely sown grain per hectare and 49 enterprises more than 6 tons of grain.

We have achieved the second biggest grain crop in our kraj in history--a bigger one was achieved only in 1980--because we harvested on the average 5.5 tons of

grain. We had a good grain harvest also in 1974--the average yield per hectare was 5.13 tons--and in 1978--5.03 tons of grain per hectare. From the areas with densely sown grain we have brought to granaries this year 301,614 tons of grain more than in 1982. We thus succeeded to a considerable extent in making up for the deficit in the fulfillment of the grain-growing program which had been caused by unfavorable weather and resulting poor grain harvest in recent years. However, we could rejoice over the situation until fall only because the overall implementation of the grain-growing program was thwarted by the long-lasting drought which substantially reduced the crop of corn for grain and thus also the total production of grain.

Despite the evident influence of weather on the crops, it is necessary to state unequivocally that the results achieved provide unmistakable proof that the agronomist can to a considerable extent mitigate the effect of favorable weather. There is no lack of such examples in our kraj and they can be documented in each okres by often diametrical differences in the crops harvested by outstanding and lagging enterprises respectively. A graphic example of agronomists' good work is the team of supervisors of crop production in the Piestany cooperative district No 3. Due to the principled expansion of cooperative relations, they achieved excellent crops of densely sown grain this year. The best evidence of this is the fact that they harvested on the average more than 6 tons of grain per hectare even in the foothill JRD [unified agricultural cooperative] in Prasnik. This definitely does not reflect extraordinary favorable weather, but rather a correct application of the principles of modern agrotechnology and of latest scientific findings.

The Piestany cooperative district possesses all the prerequisites to implement the grain-growing program of the Seventh 5-Year Plan. Their potential and above all their resolution to increase grain production as much as possible was expressed by the farmers of this cooperative district in their appeal to all grain producers in the West Slovakia kraj to reduce through joint effort the existing deficit in the fulfillment of the long-term socialist pledge of our kraj's farmers concerning grain production. The CPSL committee for the West Slovakia kraj fully supports their effort, which should become the focal point of "60'ers'" movement in the years to come.

#### Central Slovakia

Bratislava PRAVDA in Slovak 14 Dec 83 p 3

[Article by Eng Peter Valent, chief agronomist, okres agricultural administration, Banska Bystrica: "There Will Be Enough Quality Fodder"]

[Text] Fodder production is one of the most important tasks of crop production. It is the basis of the animal production increase and thus also of the economics of most agricultural enterprises. This is so also in our Banska Bystrica okres, where the permanent grassland [TTP] occupies 83 percent of agricultural land.

We have achieved some remarkable results in fodder production in recent years. This is greatly facilitated also by the movement of the "60-ers"--producers of

bulk fodder. Several enterprises in our okres meet the criteria of socialist competition of the "60-ers" every year. We had 13 such enterprises in 1980 and 1981, and 14 in 1982. This year, however, there was an extraordinary drought, precipitation was 60 percent below normal during the vegetation period and this naturally reduced crops. For example, on meadows the average yield per hectare in the okres was 4.5 tons of hay, which was 0.7 tons below the plan. In the years with normal precipitation the average yield per hectare was 5 tons on meadows, but the JRD at Sebedin, Cerina, Micina, Selce and the JRD SNP [Slovak National Uprising] at Banska Bystrica usually harvest on the average 7-8 tons of hay per hectare. Despite the drought eight enterprises met the criteria of the "60-ers" movement also this year. They are: the JRD at Helpa, Pohorela, Podlavice, Poniky, Sebedin, Selce, the JRD SNP at Banska Bystrica and in Svermovo. From degrees 4 and 5 of TTP intensity they harvested on the average more than 6.5 tons of hay per hectare. In other words, they met the principal criteria according to which they may be included among the "60-ers."

We gradually popularize experiences of outstanding growers--"60-ers" in other agricultural enterprises. For example, upon recultivation we reclassify suitable TTP land from lower intensity grades to higher grades in order to enlarge the areas for mowing. From the original 15,000 hectares we are increasing the mowing area to more than 17,000 hectares already this year and want to increase the area of meadows to 20,000 hectares by 1985. We restore the deteriorated TTP by plowing and replantation on the average an area of 800 hectares per year.

During the period between plowing and replanting we grow glycide fodders on these areas which are in short supply. We pay great attention also to the cultivation of turnips, which we did not grow in recent years. Now we have again started to cultivate them on 50 hectares and hope to increase the planting area to at least 200 hectares by 1985.

On the basis of the nutrition system recommended for individual intensity grades of TTP by the Research Institute for Meadows and Pastures, we have already fertilized 26,000 hectares of TTP in spring 1983. The agrochemical enterprise, by using its own equipment and SLOV-AIR with its pilots, significantly contributed to this project. Together they applied 55 percent of fertilizers designed for nutrition of fodder plants. By 1985 it will be already as much as 70 percent, approximately half of which will be liquid fertilizers. We have constructed 6 warehouses with a capacity of 10,200 tons of liquid fertilizers. All of them are close to the airports. Within 1 week following the first mowing we apply additional fertilizer to TTP for another harvest on the area of 8,500 hectares. Most of this work will be carried out by ACHP [agrochemical enterprise] so that equipment of agricultural enterprises will be available for collecting the harvest.

We speed up gathering of the crop through convenient cooperation among the enterprises within or even outside the okres. Our harvesters could gather fodder from the area of 1,392 hectares in the southern okreses, while cooperating enterprises gathered fodder from approximately the same area in our okres. Through this cooperation among the enterprises the crop from 2,780

hectares was harvested. All enterprises in the okres participate in this cooperation. We continue to expand and intensify the form of this cooperation.

In order to reduce losses we will construct additional warehouses for storage of hay with a capacity of 17,500 cubic meters in 1984 and 1985. Within this construction program we will build seven big capacity hay barns by the end of the Seventh 5-Year Plan that will be equipped with comprehensive mechanization and an additional drying system, which should substantially improve the quality of hay.

I have mentioned only several measures which, after the experiences of the best fodder producers--"60-ers"--are applied by the agricultural enterprises in our okres. The "60-ers" fodder producers have set an example worth following. We shall therefore make as much room as possible for their endeavor also in the future.

#### East Slovakia

Bratislava PRAVDA in Slovak 14 Dec 83 p 3

[Article by Eng Martin Tukot, agronomist, kraj agricultural administration, Kosice: "Guarantor of Abundant Crops"]

[Text] This year was generally favorable for corn growing in East Slovakia. Corn for grain grown in the sector supervised by the kraj agricultural administration--in unified agricultural cooperatives and on the state farms--helped make up for the loss in production of densely sown grain crops. This is the benefit derived from long time attention paid by the growers to this product and particularly from the systematic application of experiences of corn growers--100-ers in the trans-Carpathian area of the USSR and cooperation with the Corn Research Institute at Trnava. From the entire corn-planted area of 23,827 hectares in the kraj the farmers harvested 106,831 tons of corn, which is on the average 4.47 tons per hectare. They surpassed the corn production plan by 4,491 tons. However, since the centrally managed enterprises failed to meet the plan targets also this year, the total backlog from the beginning of this 5-year plan in the implementation of the grain-growing program was not substantially reduced.

The year which is coming to an end is instructive for us in many respects. It was again confirmed that among the grain crops corn for grain is the most productive--naturally, if we devote necessary care to its cultivation, agrotechnology, nutrition and protection. The first okres in which the people's effort was most significantly reflected in the results is the Kosice-countryside okres. The cooperative farmers and workers on the state farms grew corn for grain on 4,803 hectares this year and achieved an average yield of 5.34 per hectare. In other words, they have met the plan target for corn production by 111 percent. The biggest contribution to the accomplishment of this goal was made by the agricultural enterprises, which through their combined socialist pledge at the beginning of spring joined the family of corn growers--"60-ers." The results achieved by the prominent agricultural enterprises in this okres are really good. The JRD at Perin, for example,

produced on 340 hectares an average of 7.35 tons per hectare, the JRD at Zdana on 80 hectares 6.97 tons. A significant success was achieved also by the cooperative farmers at Budulov, who on the 500-hectare area produced an average of 8.04 tons of corn grain per hectare.

To what do these growers owe this high yield? The reply to this question can be found in work of the SM [state farm] at Moldava nad Bodvou, where they achieved an average yield per hectare of 8.31 tons on an area of 250 hectares. This is primarily the result of precise implementation of comprehensive agrotechnical and organizational measures, which began with the plowing in of organic and industrial fertilizers in the fall and end with a harvest with minimal losses. While they make use of the latest scientific and research achievements, they owe much also to the sister sovkhoz Shevchenko at Vinogradov in the trans-Carpathian area of the USSR. Following their example, they formed khozrchet brigades which are responsible for achieving the corn crop specified by the plan. In corn growing, properly chosen financial incentives based on the khzoraschet principle are also an important tool for tightening work and technological discipline.

Farmers of the above okres found effective help also in new Chersonc harvesters, which substantially reduced the grain losses in harvesting and made possible also the utilization of corn husks. They harvested the crop from 1,680 hectares, almost one-third of the area, with these machines. Ultimately the situation in the entire kraj improved in this respect. While we harvested with Chersonc machines a crop from 1,000 hectares in 1982, it was already 3,160 hectares this year. Although they were used by some agricultural enterprises for the first time, workers in all areas where they were employed demanded that their number be increased.

The standard of cultivation improved and production of corn grain increased not only in the Kosice-countryside okres, but also in other corn-growing okreses. The JRD and SM sector on the East Slovakia Plains achieved an average yield of 4.51 ton per hectare in the Michalovce okres and 4.35 tons in the Trebisov okres. The results could have been much better if they had sown corn on the entire area within the best agronomic deadlines. However, due to the floods approximately 30 percent of the corn was sown after their expiration. Subsequent drought and high temperatures in this area considerably damaged the crop.

Enriched by these experiences we set ourselves the task for next year of sowing grain corn on the entire planned area by the end of April, by 5 May at the very latest. We shall therefore use on a much larger scale the highly efficient sowing machines through cooperation. Already in the fall we emphasized the importance of putting fertilizers under corn on selected lots. At the same time we plan to increase the area of corn for grain by 3,000 hectares not only on the East Slovakia and Moldava plains, but also in the border areas of the Presov, Vranov and Roznava okreses.

We will use the approaching winter period for the popularization and practical application of the brigade form of work organization and remuneration in corn growing for grain. On the basis of experiences at Budkovce, Vysoka nad Uhom and other enterprises, we want to employ, as requested by the kraj conference in Kosice, this form of work organization and financial incentives for meeting and surpassing the plan targets in most JRD's and SM's already next year.

DECREE ON WORKING SATURDAYS IN 1984, 1985 PUBLISHED

Prague SBIRKA ZAKONU in Czech No 27, 1983 pp 759-760

[Decree of the Federal Ministry of Labor and Social Affairs of 1 November 1983 regarding modification of working time in 1984 and 1985]

[Text] The Government of the Czechoslovak Socialist Republic determined after consultation with the Central Council of Trade Unions by its resolution of 24 October 1983 in accordance with paragraph 84 of the labor codex as follows:

Modification of Working Time

[1] The working time stipulated by decree No 63/1968 of the Codex, regarding the principles for reduction of weekly working time and for introduction of operational and work modes using a 5-day workweek, or in accordance with other regulations issued by central authorities toward reduction of weekly working time, is modified so that working days (additional workshifts) in 1984 will also include Saturdays falling on 31 March, 12 May, 29 September and 10 November and, in 1985, also Saturdays falling on 23 March, 13 April, 28 September, 19 October and 16 November.

[2] Organizations with seasonal need for labor can appoint, in agreement with the relevant trade union organ and in accordance with instructions of the relevant central authority, in lieu of the specified days four working Saturdays in 1984 and five working Saturdays in 1985 in other terms suitable for meeting economic tasks, if transportation can be provided for taking personnel to work and back.

[3] The length of additional workshifts on the days listed in the preceding paragraph is equal to the length of the shift scheduled in the organization on the Friday preceding this shift.

[4] If according to the workshift schedule a worker's regular workshift falls on one of the workdays listed in paragraph 1, the organization will assign to this worker, after consultation with the plant council of the basic organization of the Revolutionary Trade Union Movement (hereafter "plant council"), additional workshifts on another suitable day of the same or of the subsequent month.

[5] Organizations can, with the consent of the plant council and state organs after consultation with the latter, transfer second and third shifts in workplaces with intermittent operation that fall on the days listed in paragraph 1 to other suitable days in the same or the subsequent month.

[6] The modification of working time listed in paragraph 1 applies also to workers who have an agreement with the organization for a shorter working time (paragraph 86 and paragraph 156, section 2 of the labor code), with the exception of workers whose working time was shortened on the basis of a medical certificate to a certain number of hours per week, in whose case participation in an additional workshift would exceed this shorter working time.

[7] Working time is not modified for young workers below age 16, workers in workplaces with continuous operation, workers with working time permanently distributed over 6 days per week and workers in operations where working time was reduced for reasons of health. However, in the case of a worker with working time permanently distributed over 6 days per week, should his regular workshift fall according to the workshift schedule on one of the working days listed in section 1, his working time on that day will be modified so as to match the length of the shift scheduled in the organization on the Friday preceding that shift; no modification is made if his regular shift falling on that day is longer.

[8] Should the worker have not even 1 day of continuous rest in a week in consequence of working time modification in accordance with section 1, the organization, after consultation with the plant council, will transfer one workshift from that week to some other day of continuous rest in another week of the same or the subsequent month.

[9] Should the additional workshift according to sections 1, 4, 5 or 8 coincide with a worker's leave, on which he draws to the extent of at least one consecutive calendar week, that day does not affect the number of workdays used up by the worker as leave. Wage reimbursement for leave taken for recuperation will be received by such worker for as many working days of leave as he forfeited according to the shift schedule extended by an additional workshift.

#### Remuneration for Work

[10] For work in additional workshifts (sections 1, 4, 5 and 8) the worker is due a wage in the amount stipulated by wage regulations. The basic wages of personnel paid a monthly salary are not increased in connection with working additional workshifts.

[11] Work in additional workshifts is not overtime work and for that reason the worker is not authorized to receive a premium for overtime work, nor compensatory time off according to paragraph 116 of the labor code.

[12] For work performed on days listed in sections 1 and 5 the worker is not entitled to preferential wages for work on Saturdays and Sundays, even if it does not involve work in additional workshifts.

[13] Insofar as a worker is assigned an additional workshift on another Saturday or Sunday in connection with the provisions of sections 4 or 8, he is entitled for work on those days to preferential wages for work on Saturdays and Sundays.\*

Concluding Provision

This decree becomes effective on the day of its promulgation.

/signed/ Minister: Eng Boda

\*Wage regulations issued by central authorities, insofar as these regulations do not apply to work on Saturdays and Sundays, Decree of the Ministry of Labor and Social Affairs No 200/1968 of the Codex, regarding preferential wages for work on Saturdays and Sundays.

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## EXPERIMENT IN PAY ACCORDING TO WORK DESCRIBED

Prague SVET PRACE in Czech No 20, 1983. pp 10-11

[Article by Jana Hajkova: "He Who Works Harder Also Earns More Money"]

[Text] At first glance it looks like quite an ordinary factory, or rather like a small factory. In a small courtyard we encounter people with grey-white powder on their faces and in their hair, and this betrays the fact that almost invisible cement particles fly all over the place. We examine this plant manufacturing highway panels so to say from the basement to the attic. One intrusive question pursues us all the time: why was it precisely here at Prefa in Chrastava that they have embarked upon an experiment--the brigade form of remuneration and work organization--something that many other work places, obviously with much better and more modern equipment, have not dared to do? The very word "experiment" sometimes evokes in man distrust, uncertainty and gives rise to various questions..."it may be only a project concocted by somebody high up, but work will be done in the old way except that there will be new forms and reports..."

## Where Is an Experiment Permitted?

The situation in the plant was not very rosy only some 5-6 years ago. Work discipline also sometimes wavered, in rare instances unfortunately because of a restaurant nearby. At almost 5 minutes to 12 the manager's chair was occupied by Frantisek Prochazka, who, full of vigor, vitality and elan--and this is true of him even today--personally took over the management of the plant with a firm hand and began to put things in order. To gain authority among these hard men who are in the majority here was not easy. Definitely not because of his physical appearance, as it may seem at the first glance, but because of his direct and frank behavior he acquired the reputation of a man whose word settles the issues. And what does he say personally about himself? "If I want people to do something, I must set an example. I do not like overcautiousness because I think that one must not be afraid of conflict situations. If I am convinced that my opinion is correct, I do not back down. But the main thing is to be among people all the time, not to confine one's activity to management from one's office, but to have one or two glasses of beer with one's men in a pub after the production conference is concluded."

Some time later the situation in the plant really changed 180 degrees. This was brought about not only by firm management, but also by some occasional minor improvements and, last but not least, also by the new forms of competition. The Chrastava plant suddenly began to appear on one of the first rungs on the evaluation ladder of the 12 plants of the Prefa Usti nad Labem national enterprise. A good experience was thus born: the ability to solve problematic situations jointly. When the people at the enterprise headquarters were to decide where to begin with the experimental verification of the brigade work organization, the proposal was unanimous: Chrastava.

#### To Manage or To Be Managed?

That October Friday, when we traveled to Chrastava, was not chosen by us accidentally. We had been invited to a joint evaluation of the past period and could convince ourselves on the spot how the experiment was proceeding. We discussed some arguments in favor of and against it with the plant manager, economic deputy enterprise manager Karel Trminek, head of labor economics Vaclav Honzejek and Jiri Safar, head of the entire 27-member brigade and also the spokesman of workers in the concrete reinforcement shop, mixing shop, shipping department, boiler room and maintenance. Here are their answers.

[Karel Trminek] We did not have any experience with the brigade form of remuneration and so we traveled with colleague Honzejek to our sister plant Prefabrikace Bratislava, where they knew already much more about it. Although we had in our hand the principles issued by the Ministry of Labor and Social Affairs in cooperation with URO [Central Council of Trade Unions], they served us as a general guide only. We did not find there, for example, how to proceed concretely in wage policy, how to reduce or increase premiums, and so on. We had chosen the Chrastava plant also because it had won, for compliance with all indicators, already several times in the past the Competition Banner of the enterprise manager and PV [Enterprise committee] of ROH [Revolutionary Trade Union Movement] for the Seventh 5-Year Plan and, if it meets specified indicators also this half-year, it has a real chance of winning it for permanent possession. In case of some difficulties the Chrastava workers would cope with them better than others. There is only a small step from theory to practice. The most important was to explain to people in advance, briefly and clearly with the effective assistance of economic management and the ROH ZV [Factory committee], what it was all about, to pave the way for experimenting and not to shroud the issue with complex and formulas incomprehensible to the layman. The essential thing is that if the blue-collar worker is "not merely managed" by his foreman, but thinks independently, continuously improves work assigned to him, in other words, manages by himself, then he will have a chance of getting ahead on payday more than before.

[Karel Trminek] One must bear in mind that the brigade form of remuneration is wholly based on khozraschet and that all indicators of the brigade's evaluation are linked to those according to which the results of the entire plant and enterprise are judged. Every member of the brigade is financially interested in the result achieved by the entire brigade and should exert

effort accordingly. We also had to examine individual workplaces scrupulously in terms of the approved number of positions, which meant determining the absolutely indispensable number of workers. At the same time it was necessary to put in order the technical-economic standards which we have somewhat tightened. Last but not least, we had to solve the problem of the faltering flow of supplies because the brigade cannot be blamed, for example, if sand is not available.

#### Rules of the Game

Vaclav Honzejk A 3-month agreement was signed by the economic management, ROH ZV and brigadier on behalf of the brigade. The brigade knows in advance the production plan (commodity production), economic tasks (profit, cost...), but also the limit on the number of defective products or occupational injuries. The agreement stipulates precisely not only what the brigade is to do, but also what it receives upon the fulfillment, overfulfillment or nonfulfillment of the task.

Question Could you give us a specific example? By what amount are the brigade premiums increased if it surpasses the planned profit in a particular month?

Vaclav Honzejk For every Kcs 10,000 that the planned profit is surpassed, the planned wages payable increase Kcs 200, while in the opposite case they are reduced by Kcs 500. I will give you another example. For every Kcs 1,000 reduction in the value of rejects below the allowed limit, the planned wages payable increase Kcs 100, while they are reduced Kcs 500 in the opposite case.

Question You quoted some figures. I would be interested, however, in whether the penalties for nonfulfillment or for the number of rejects exceeding the limit are not too high. How did you figure out these "sanctions"?

Karel Trminek It was by no means an arbitrary process. The determination of individual amounts was preceded by a number of detailed calculations based on the guidelines for wages payable. First we experimented with various "tentative" variations in order to verify what our plant could and could not do. As the first experiences demonstrated, the correctness of these very time-consuming calculations has been confirmed.

Question You have introduced this new form of work during the summer months, that is, during the vacation period. What was your motivation to do so?

Frantisek Prochazka To tell the truth, we wanted to find out whether under the aggravated conditions we would be able to cope with this task. Four people usually work on the big horizontal production line. Although there were only three workers in summer, during the vacation period, the plan was surpassed. The brigade pledged itself to perform the assigned tasks even if some workers would have been interested in fulfilling the task to the extent required by the efficiency norm. The new conditions, however, force them to work even on behalf of the absent blue-collar worker because they know exactly how much more they will earn.

## Green Notebook

We look jointly into the big green notebook which reminds me a little of the school journal. It lists all members of the brigade, but the grades--points: 0,1,2--in various subjects are given by the foreman instead of a teacher: multiprofessional skill; observance of technological discipline; work discipline; late reporting to work; work in key workplaces...The resulting grade for the month is the total of all points which, taking into account the wage according to the scale, determines jointly how much the respective individuals will receive from the total brigade premium. All this must be approved by the brigade council, consisting of the brigadier, manager, foreman and representative of the ROH ZV.

And what has Jiri Safranek, the spokesman for the entire brigade, to say to that?

"I think that people rapidly got used to the new conditions and, what is most important, know that they can earn more. The allocation of points is public so we can easily determine who really worked hard and who just "rode along. When shortcomings were discovered in the past, it was always the foreman who had to intervene. The situation is changed today: we discuss things much more among ourselves, people try much harder, try to find new solutions which would improve or facilitate their specific work. If somebody does not work, we will not tolerate him among us." It is not the purpose of our narrative to conceal the existence of problems in this sensitive area of remuneration, even if the results achieved at Chrastava during one "more difficult" summer month so suggest: commodity production was surpassed by Kcs 51,000, while the percentage of defective products remained within the norm. We just wanted to demonstrate in one small example how one can distinguish between average work and inferior work, how it is possible to translate into reality that well-known adage: "to remunerate according to work actually performed."

The manager of Prefa Chrastava can be satisfied for the time being because he proved able to look after his plant not only from the position of the "firm hand," but perhaps also because he can keep his continuous watch over his little factory even after working hours are over--he can survey the courtyard from the windows of his apartment and can thus exercise a sort of "remote control." He will soon need this unusual experience because, as a result of mergers, he has now also been put in charge of a plant in Raspenava. His secret wish is to introduce as soon as possible new conditions of work and remuneration in that plant also, and to tell the workers that if they work harder they also will make more money.

10501

CSO: 2400/149

TRANSPORTATION RATES RESTRUCTURED AFTER JANUARY 1984

Prague HOSPODARSKE NOVINY in Slovak 2 Dec 83 p 6

[Article by Eng Jozef Hanulik, Federal Ministry of Transportation: "Comprehensive Restructuring of Tariffs in Cargo Transportation as of 1 January 1984"]

[Text] In accordance with the CSSR Government Resolution No 16 of 20 January 1983 regarding the key orientations for development of wholesale prices in 1984, as of 1 January of next year there will occur a comprehensive restructuring of domestic rates for transportation of goods and a modification of the price level expressed in wholesale prices. This comprehensive restructuring applies to cargo transportation, specifically by railroad, highway and water, excluding airfreight transportation which, for all practical purposes, is but an adjunct to passenger transport. No changes will occur in rates for transportation of passengers, baggage and express shipments.

Such a comprehensive restructuring of domestic transportation rates in cargo transportation affecting all of its sectors and commencing simultaneously on a single day has never been undertaken before. Comprehensive restructuring of wholesale prices in the national economy used to be accompanied by merely partial changes in transportation, an increase of even a decrease in the level of prices, or, eventually, by minor structural changes applying separately to individual transportation sectors. It always proceeded from the contention that the setting of prices and determination of the price level in domestic rates for transportation of goods is a considerably complex proposition.

Changes in Price Level

Even though the pressure on additional price increased for fuels, energy and selected raw materials showed a significant increase as early as the outset of the Seventh 5-Year Plan, the sectors under the jurisdiction of the Federal Ministry of Transportation acted in the first stage of a one-time modification of wholesale prices (as of 1 January 1981) acted for the most part only as customers for fuels, lubricants and other petroleum products, heating oils, electric energy, heat and solid fuels.

As supplier, the ministry put into effect as of 1 January 1981 only partial modifications of domestic rates for transportation of goods by railroads:

--a charge increase from Kcs 5 to Kcs 7 for a two-axle freight car and from Kcs 10 to Kcs 14 for a four-axle car;

--an increase in the shortest distance for computation of freight charges to a minimum of 50 km (with certain exceptions);

--an increase in the price level of other supplementary and railroad siding charges by an average of 15 percent.

During the stage of one-time modification of wholesale prices (from 1 January 1982) the price level of transportation rates increased as a result of recomputation of the effects of wholesale price increases in the fuel and energy base by 15 percent in railroad transportation and by 11-14 percent in water transport. Highway transportation rates did not increase, because most materials and all fuels were procured at retail prices which were not increased in that period. Partial structural changes were made in railroad transportation freight charges by transferring certain construction materials from the cheaper fifth class rate to the more expensive fourth class rate with the objective of using also prices to influence lowering of demands on transportation and shortening the transportation distance. On the other hand, rebates to shippers for marshalling combined shipment trains were increased by 15 percent.

#### Restructuring of Rates as of 1 January 1984

The overall maximum increase in transportation rates for domestic transportation of goods as of 1 January of next year was set at 9.84 percent, of which 9.744 percent accrues to railroad, 9.20 percent to highway and 27.37 percent to water transportation.

Measures of the Federal Price Control Bureau for the comprehensive restructuring of transportation rates as of 1 January 1984 set the rate of profit for railroad freight transportation at 24 percent and for highway cargo transportation at 12 percent of their own planned total costs for 1985 which reflect the effect of the varying relation of both sectors to the transportation route. No rate of profit was set for water transportation, as it depends on the level of rates charged by railroad and highway transportation.

(The level of rates for domestic transportation of goods on the Elbe-Moldau and Danube waterways is lower, due to transportation policy reasons, by 15-20 percent in comparison to the price level of the cheapest third class rate of the CSD [Czechoslovak State Railroads] tariffs for transportation of bulk goods transportation by freight cars and the second class rate for other goods.)

The comprehensive restructuring affects the following rates:

--In railroad transportation it applies to transportation of full carloads, to international transportation of less-than-carload lots, to providing of transportation and siding services;

--In highway transportation it involves freight transport rates in domestic transportation and rates for customs declaration services by CSAD [Czechoslovak Automotive Transportation] in customs clearance of highway vehicles;

--In water transportation changes are made in the rates for domestic river transport along the Elbe-Moldau waterway, further in rates for loading and for storage in river ports and transloading stations of the Czechoslovak Elbe-Oder Navigation Lines, in domestic river transport along the Danubian waterway and for transloading and storage of goods in Czechoslovak ports on the Danube River;

--Changes also affect transportation systems, namely the CSD rates for combined loading and unloading, the CSAD rates for pick-up services and the containerized transport system.

#### Full-Carload Shipments

The CSD rate for transportation of full-carload shipments holds a dominant position since it constitutes by far the major part of railroad freight transportation and consequently exerts a decisive influence on the economic results of railroad freight transportation.

Thus, it was only logical that great attention and care was devoted to calculations of freight charges mainly in the area of cost analysis for individual technological operations in the transportation and shipping process and their classification with regard to the measure of their dependence on specified indicators, transportation risks, empty running of transportation means, etc.

Analytic calculations of assorted costs showed basic changes in computation of freight charges, whereby approximately 78 percent of costs accrue to the base rate and approximately 22 percent of costs to the rate increment. The average transportation distance ranges at the same time around 250 km with shipments ranging from 10 to 1,000 km. The requirement put on structuring the rates was that freight charges meet, on the one hand, own costs of transportation over any distance and, on the other hand, show an equal level of profitability. This was not the case in the past and part of the base rate became dissolved in the rate increment and, therefore, shipments up to a distance of 160-180 km resulted in losses while profitability sharply increased for shipments beyond this distance.

The current structure of the base rate and rate increment does away with the above shortcoming and provides for uniform profitability for each specific transportation distance. As a consequence of this modification there occurs an up to 11 percent increase in freight charges for short distances and for long distance transportation there occurs a decrease in comparison to the existing freight charges.

One more important change must be taken into consideration in structuring of freight charges: the computed freight charge includes in its base rate also reimbursement for idle time of railroad freight cars during load handling, specifically 6 hours for loading and 6 hours for unloading.

Calculations further showed that it is possible to simplify and cut down the number of rate classes into which the transported goods are classified, specifically from 5 rate classes to three rate classes. At the same time there is a need for adjusting the brackets between rate classes to a ratio of 100:120:150 (up to now the ratio between first and fifth rate classes was 100:121.5), because such differentiation reflects more suitably the demands of various types of goods on loading space and on the capacity specifications of the rolling stock.

Classification of goods into new rate classes was done in accordance with several basic viewpoints with the objective of having the freight charge for a minimal shipment weight provide a substantial part of reimbursement for use of the available payload volume of a transportation unit.

In following up the decision that a transportation unit for the purposes of the new rate modification is constituted by a car and not a car unit, ergo that no differentiation is made between a 2- or 3-axle car and a car with 4 or more axles (which represents 2 car units), a determination was made of minimum weights for which freight charges are assessed:

--10 tons in the 1st tariff class,

--17 tons in the 2nd tariff class,

--25 tons in the 3rd tariff class.

Specialized calculations provided the basis for determining the level of freight charges for transportation outside of tariff classes, specifically for shipments by specifically marshalled freight trains and subject to exceptional rates.

The rates for shippers offer preference to shipments using freight cars owned by shippers by lowering the freight charge by 15 percent (10 percent up to now) and increasing the bonus for marshalling integrated shippers' trains.

Not included among the costs for calculation of freight charges are expenditures for operations and activities by the railroad that are not always carried out in connection with transportation and apply specifically to only certain types of transportation, but which the shipper can request the transporter to perform as part of the shipping process.

The price level of the so-called supplementary charges corresponded up to now only to own costs which made it necessary to increase them by a profit margin mark-up and eventually to balance their price level with other transportation sectors.



## Highway Transport

Highway freight transport rates for domestic transportation are binding for all organizations performing freight transportation for payment on behalf of others by vehicles designed for motorized freight transportation.

The rates were detailed in such a manner as to tie in provisions of the tariff conditions with the corresponding freight charge tariffs which in the form of a base rate and rate increment include costs connected only with loading, unloading and travel of vehicle with a load; meaning that the shipper is not paying for the travel of vehicle without a load, just as before.

The structure of freight charges includes primarily the following two new elements:

--the rate scale applied to calculation of freight charges is graduated by zones with direct linkage to specific weights or volumes of shipments;

--freight charges are stipulated in tariff zones for kilometers traveled by a vehicle with a load and no billing is made for reimbursement for travel without a load (travel connected with making the vehicle available for loading, waiting and transloading).

Tariffs of freight charges for shipments performed by flat-bed, dump, box-type and other selected special-purpose vehicles actually state the freight charge expressed in Kcs per ton in eight tariff steps for the corresponding tariff zones graduated by 5 kilometers from 5 to 10 km and further by 10 kilometers up to 100 km and then for every 10 km even if only started. The tariff steps for box-type vehicles are expressed in cubic meters. The specified freight charge rates provide for significant rate decreases in dependence on the shipping distance.

A part of the tariff is formed by freight charge rates for performance by vehicles and mobile transloaders during transportation of large containers which relate to performances billed by the transporter, the CSKD [Czechoslovak Container Transport]-Intrans, as the exclusive operator of the container transport system in the CSSR.

An independent tariff of freight charges applies to performance in transportation of heavy and bulky loads for vehicles of domestic or foreign production. A part of the freight charge tariff is reimbursement for use of selected types of special-purpose equipment by the transporter.

The new tariff of freight rates charges for performance by vehicles with a payload of up to 1,200 kg and for transportation of individual items and added loads.

The structural changes implemented in highway freight transportation for the first time apply to freight charge rates a uniform profitability depending

on individual groups of transports. They provide primarily for a noticeable increase in freight charges for flat-bed trucks, mobile operational mechanisms and other special-purpose vehicles. These changes should become reflected in the coming period by pressure exerted on the quality, efficiency and economy of transport operations. Decreasing interest can be expected in plant and agricultural transportation and in those types of transportation meeting the needs of others where there occurs a decrease in freight charge rates or their stagnation--mainly in transportation of bulk goods by dump trucks.

Among other key structural changes that will become positively manifested in the new tariff will be also a reduction in the number of tariff steps and freight charge rates as well as a substantial reduction in the number of surcharges.

On the basis of preliminary balancing it is expected that the tariff will also affect economy in the consumption of fuels (reduced idle run of vehicles), lowering of demands on transportation and systematic distribution of transport operations among transportation sectors.

#### New System in Water Transport

Structural reorganization of the tariff for domestic transportation of goods along the Elbe-Moldau waterway led to significant thematical and conceptual changes in comparison to the existing tariff:

--relative parity tariffs were replaced by a graduated tariff, i.e., charges based on weight and shipping distance in 5 km increments up to 100 km and 10 km increments in excess of 100 km;

--the weight unit of 100 kg was replaced by 1 ton and actual weight for tariff purposes is rounded upward to whole tons;

--here apply three freight charge tariffs derived in essence from the CSD tariff for transportation of full-carload shipments.

These changes represent a substantial simplification in calculation and control of freight charges, to include use of computer technology. Freight charge rates for medium distances are lower in comparison to freight charges in highway transportation, so that in distribution of transport operations water transportation can easily find application in accordance with the principles of government resolution No 215/1977.

In the tariff for domestic river transportation of goods along the Danubian waterway--the same as in the tariff for the Elbe-Moldau waterway--there is a change in conceptual orientation in that enterprise tariffs become a generally binding tariff for all operators.

The unit of weight is 1 ton, for which freight charges are assessed according to the freight charge tariff, which includes seven tariff classes based on the prescribed nomenclature and classification of goods. Distance zones

are graduated by 15 km up to a distance of 90 km and by 30 km in excess of 90 km.

The peculiar feature of this tariff is that freight charge rates for transportation upstream are increased by 20 to 30 percent in keeping with higher costs.

#### For Development of Containerization

Since 1969 the container transport system tariff has been significantly affecting the development of the youngest transport system, namely the container system. This applies to domestic transportation of container shipments as well as to international railroad transportation when the CSSR is the country of origin or of destination (except shipments in the INTER-CONTAINER system), to direct domestic highway and water transport as well as to domestic combined transportation provided by the CSKD-Intrans organization in Prague as the exclusive transporter in the CSSR.

The traffic price level from 1 January 1984 has been set so that CSKD Intrans can reimburse individual transportation sectors for subcontracted transportation services in accordance with sectoral tariffs and, in addition, receive reimbursement for its operations. This surcharge for CSKD Intrans operations is divided among individual transports so that CSKD Intrans can support combined shipments at the expense of individual direct shipments--which is the intent behind the container transport system--and obtain in this manner these surcharges from each transportation sector.

The new tariff retains in essence a system similar to that of the previous tariff. Freight charges are again divided according to the transportation sector used, but the previous weight gradations have been rescinded. It systematically applies the principle that the shipper pays freight charges for a large container regardless of the amount of the good actually loaded, encouraging shippers to strive for economy and making transportation cheaper by utilization of loading capacity. Some additional reimbursements are based on supplementary reimbursements of transportation sectors tariffs and are essentially equal to them. Reimbursement for the use of large containers remains at the existing price level.

Comprehensive restructuring of transportation tariffs and the tariff policy concept created an economic level of tariffs in freight transportation and the price levels of tariffs came considerably closer to reflecting the requisite social costs. This will improve the motivational role of tariffs while aligning tariff dynamism with the dynamism of costs and of the system of incentives.

8204

CSO: 2400/142

INCREASE IN USE, COLLECTION OF SECONDARY RAW MATERIALS

East Berlin PRESSE-INFORMATIONEN in German No 144, 9 Dec 83 pp 3-4

/Article by Hans-Joachim Schmidt, general director, VE Combine Secondary Raw Materials Collection: "The Use of Secondary Raw Materials Begins With Their Complete Collection"

/Text/ The seventh meeting of the SED central committee called for an even farther-reaching utilization of all raw materials. In the course of the current 5 Year Plan, 72 investment projects are being carried out in our national economy for the processing and utilization of secondary raw materials. In this connection, Erich Honecker stated that "when these projects are in full swing, we will get approximately 900 million marks' worth of raw materials returned back to us from the cyclical processes of our national economy." However, it is only possible to make use of what has actually been collected. It is more necessary than ever before to open up all reserves and to find new scientific solutions for the purpose of including in our national economy's material-processing cycle even those secondary raw materials which it has hitherto not been possible to utilize. With the solution of these tasks a substantial contribution will be made towards the achievement of a further performance increase with the same, or reduced, raw material and other material funds.

Our combine will have to make a substantial contribution to the achievement of this goal. Its task in particular is the as complete as possible collection of all secondary raw materials from the households of the population. In this connection we are making efforts to be reliable partners of the citizens of our republic. Thus, for instance, we are concentrating on expanding the network of the state-owned delivery stations, which has in the course of this year increased to more than 1,600 such stations from 1,200 in 1979, and on guaranteeing hours of operation which are constant and set at times favored by our customers. Just as important are a regular and uninterrupted flow of removal of the materials from the delivery stations and regular provision of empty receptacles. We propose additionally to facilitate the delivery of secondary raw materials for our citizens by creating short cuts for them.

Our Most Important Partners Are Our Citizens

At the present time, approximately 11 percent of our national economy's requirements for important raw materials are covered by secondary raw materials and

waste products. This amounts to approximately 27 million tons, and it means that primary raw materials worth 5.6 billion marks are being saved. In 1982, we took in from the households and residential areas of our population 264,000 tons of waste paper, 418,000 tons of collected scrap, 55,500 tons of used textile materials, and more than a billion bottles and glasses. Due to the fact that new scientific-technical solutions were found, our combine was able to include in this collection program fixing-bath solutions for reclaiming silver, no longer needed X-ray film, black and white film, spraying cans, and thermoplastic refuse items to be collected from the households. Corresponding to the increasing requirements of our national economy and the population's increased readiness to contribute, we are jointly with industry and the VE Combine Metal Processing making preparations for guaranteeing in the foreseeable future the collection of additional, hitherto not usable, secondary raw materials. These, for instance, include scrap porcelain, scrap electronic items, and batteries of all kinds.

Such important and indispensable partners as the National Front of the GDR, the technical organs of the Kreis and Bezirk councils, the FDJ /Free German Youth Organization/, and the pioneer organizations of the DFD /Democratic Women's League of Germany/, the People's Solidarity, and our veterans had a considerable share in the collection results of the combine and of the increased readiness to contribute on the part of the population. Annual average increase rates of four to five percent would not be possible without their energetic and initiative-rich cooperation in connection with the collection of secondary raw materials. Very advantageous--both for our citizens and for our national economy--has proved to be the setting up of collection bases. They are also manned by citizens who were recruited for this purpose by the social organs.

In addition to the establishment and improvement of the collection base network operated under the responsibility of our combine, it is now necessary in cooperation with the local organs and the National Front to set up even more social collection bases to be operated by the citizens under the guidance of the VE Combine Secondary Raw Materials Collection. The advantages of this are clear: Such citizen-related collection stations, of which there presently exist 650, enhance the willingness to contribute, particularly since the hours of operation are chosen on the basis of the customers' wishes, and they can be set up without any high material and financial expenditures. There are no periods of their being shut down because of vacation leave, illness, and so forth, because the citizens entrusted with the collection work will substitute for one another.

The established objective is to set up by the end of 1984 at least 2,200 such installations in locations where there are as yet no adequate possibilities for the citizens to contribute.

Pirna Kreis, for instance, has already set up 13 social collection bases which, supported by the local organs and the Pirna branch of the Dresden VE Combine Secondary Raw Material Collection are developing well and proving their worth.

## New Quality of Cooperation

Good experiences have already been gathered in other Kreise too. Thus, for instance, the citizens organized and active in the socialist youth organization, in youth and village clubs, in the Mutual Peasants' Assistance Association, in the Union of Small Gardeners, Settlers, and Small Livestock Breeders, in the GDR Fishermen's League, and in the volunteer fire brigades are in many places making efforts to see to it that the collection bases are always operative. A new quality of cooperation on the part of social forces is becoming clearly noticeable in connection with the collection of secondary raw materials, which is materially and financially being furthered by the VE Combine Secondary Raw Material Collection and its operational branches.

The creation of so-called collection groups has also proved its worth. In these working groups, the supervisors of the operational branches of the VE Combine Secondary Raw Materials Collection in the Kreise, social organizations, tradesmen, and collectors holding a collector's certificate are represented. They consult jointly as to how to proceed in order to create further prerequisites for a higher yield of secondary raw materials through cooperation involving division of labor. One way to proceed, for instance, is additional placement of wire containers and other receptacles in front of department stores and high-rise buildings in order to facilitate the citizens' deliveries of thermoplastic waste materials, waste paper, broken glass, and small scrap materials. The collection and utilization results of these valuable raw materials will be all the more favorable if the citizens also take care to see to it that no heterogeneous articles, waste items, or dirt are placed in the containers.

8272

CSO: 2300/210

HUNGARY

COUNCIL NOTES TROUBLED YEAR FOR AGRICULTURAL CO-OPS

Budapest NEPSZABADSAG in Hungarian 22 Dec 83 p 5

[Summary] The presidium of TOT [National Council of Producer Cooperatives] held its final session for '83 in Budapest. The meeting was chaired by TOT president, Istvan Szabo. The findings of the meeting were as follows: 1983 yields for wheat were relatively good but poor for corn due to the severe drought. The drought caused shortfalls of 30 and 21 percent in sugar beet and potato yields respectively.

The herd of cattle declined by 2 percent while the number of hogs privately raised increased by 10 percent; this was in excess of the national average.

Although cooperative ancillary activities continued to proliferate, profits therefrom tended to decline.

Agriculture was unable to meet national economic targets. Calculated in current prices agricultural output was to have increased by 8-9 percent; actual growth will probably amount to 1-2 percent.

Sales possibilities varied according to agricultural branch. Most farms adapted readily to changes in prices, financial regulators and market demand. Nevertheless, serious problems arose with the sale of apples and sheep, and even poultry eggs, fish, leather, wine, honey and fattened hogs could be sold only gradually after they had been stockpiled. Despite exercise of greater thrift, the outlays of cooperative increased by about 10 percent as the result of the higher price of industrial merchandise and expenditures resulting from the drought. Cooperative profits declined by 15-20 percent nationwide; according to some calculations, the drop was even greater.

Preliminary estimates indicate that 175-180 cooperatives will suffer a deficit or shortage of funds. Despite an annual value of production amounting to 214 billion forints, the cooperatives have a shortage of 2 billion forints.

CSO: 2500/163

## HUNGARY

### NATIONAL HIGHWAY SYSTEM DESCRIBED

Warsaw ZEITSCHRIFT DER OSSHD in German No 5, 1983 pp 12-16

[Article by I. Banoczy and L. Szecsi, Ministry of Transportation: "The Highway Network of the Hungarian People's Republic"]

[Text] 1. Introduction

Following World War II motorization in Hungary developed only slowly. Even in 1960 no more than 31,000 passenger cars and about the same number of trucks constituted the country's stock of vehicles.

The road network was about 30,000 kms long, 6,000 of which made up the main network. This figure has not changed in the last 20 years; expansion has been seen in the enlarging of main highways and the improvement in the level of the network has been seen in the better quality and widening of the lanes as well as in the improvement of technical parameters.

At the beginning of the 1960s, in spite of the relatively small number of vehicles, occasional traffic jams occurred on some main roads, because 50 per cent of the total traffic was handled on the main road network.

The most overloaded was the stretch linking Budapest with the most popular vacation area, the Balaton, designated at the time as major traffic artery No 7. The importance of this road was increased even more by the freight traffic from central Transdanubia and international traffic directed principally at the Adriatic coast. Designated as E 96, it formed part of the European highway network. To eliminate the overloading, the decision was made to satisfy the requirements with a major highway having a larger capacity and with a higher level of performance.

In accordance with this resolution construction of the first Hungarian superhighway, designated as M7, began in 1960. The developments of the two decades that have passed since then show that starting construction of a superhighway was a correct decision, since the number of vehicles (in 1982 more than 1 million passenger cars, more than 200,000 trucks and 500,000 motorcycles) and road traffic, as well as the entire development of the economy, showed a convulsive growth.



## 2. Superhighway M7 between Budapest and Siofok

For us the design of the first Hungarian superhighway meant the solution of a novel task. Traffic counts and prognoses served as the basis for planning. As part of this, the flow of daytime and nighttime traffic, and the ratio of both, was analyzed. The proposal for expansion and the schedule were drawn up with full consideration of the nation's traffic development and the special problems with traffic on the section to Balaton.

The section extending to the city of Siofok (kilometer 5 to kilometer 112) of highway M7 has a design speed of 120 kms/hour. But after the design regulations were changed in the interim and/or were only worked out for the highway in the course of the work, the parameters do not have the same minimum values along the entire route.

Table 1. Characteristic Main Parameters for Superhighway M7

		Kilometer	
		5 to 56	57 to 112
Design speed	kms/hour	120	120
Smallest layout curve radius	meters	600	750
Steepest grade	percent	4	4
Smallest summit radius	meters	15,000	20,000
Smallest basin radius	meters	5,000	10,000

With respect to the characteristic section values it should be mentioned that the road surface width of the 2 X 3-lane highway (Budapest access sections of superhighways M1 and M7) in its final expansion is 35.00 meters, that of the 2 X 2-lane highway is 28.00 meters. A single lane of the main pavement is 3.75 meters wide, the shoulder is 3.00 meters wide. In the final expansion stage the median is 5.00 meters wide. These cross sectional data are uniform for all Hungarian superhighways.

Taking the most important viewpoints into consideration, i.e., the anticipated traffic flow figures and reaching the Balaton area as soon as possible, it was decided that the cross sectional expansion of the road route was to be carried out in stages. In the first stage of construction 1 X 2 lanes (semi-superhighway) with a crown width of 15.50 meters were built and, by working continuously, were widened between kilometers 12 and 90 to a 2 X 2-lane and between kilometers 5 and 12 (common access section of superhighways M1 and M7) to a 2 X 3-lane highway, while the section from kilometer 90 to 112 on the south shore of the Balaton is still functioning today as a semi-superhighway. It should be mentioned at this point that the road in the prospective plans leading to the north shore of the Balaton will branch off from the superhighway in the area of kilometer 70. Consequently, this section will have to be expanded later to 2 X 3 lanes. Expanding the final crown width made this possible. The median is presently 12.50 meters wide.

The main pavement has a single-layer basalt concrete surface, under which are --in accordance with the development of planning and method of construction-- mechanical soil and/or cement stabilization layers and bituminous support

layers. The basalt concrete has a depth varying by section of 20 to 24 cms. The shoulder is of asphalt construction, whose depth is also variable according to planning development.

There are 152 structures on the 107-km long route to cross roads, railroad lines and watercourses. Their construction also reflects developments in cross sectional solutions as full slabs, slabs with cutouts and box-section beams.

There are 12 access points, generally intended to provide a link to larger localities and/or a connection with the more important highways. There are service areas at four locations, the average distance between the rest areas is 6 to 8 kms. Their facilities (restaurant, fast-food, toilets, tables, benches) depend on the size.

The joint access Budapest access section of superhighways M1 and M7 was opened to traffic in 1965 with 2 X 2 lanes. Widening the pavement to 2 X 3 lanes --reinforcing the asphalt at the same time--was carried out in 1979.

The individual sections of superhighway M7 were opened to traffic at the following times:

Left pavement:	kilometer 13 to 30	1966
	kilometer 31 to 43	1967
	kilometer 44 to 56	1968
	kilometer 57 to 90	1970
	kilometer 91 to 112	1971
Right pavement	kilometer 13 to 30	1972
	kilometer 31 to 56	1973
	kilometer 57 to 90	1975

Operating and maintenance tasks are carried out by two centrally controlled superhighway commissions over a section 50 to 60 kms long. They work on a linear system and have only assignments connected with the superhighway. The number of personnel and the machinery and equipment of the highway commissions ensures that operating and maintenance jobs are carried out in summer and in winter. To meet the needs of the road users, emergency telephones are situated every 2 kms to report accidents or breakdowns. The highway police, the dispatcher service of the highway commissions and the towing and repair service operated by it ensure trouble-free traffic flow.

### 3. Superhighway between Budapest and Győr

The area served by and the importance of superhighway M1 were viewed in the plans to develop the highway network from both a national and an international point of view.

By the mid 1960s it was already apparent that the speed of traffic growth on highway No 1 exceeded the national average. This was the result partly of domestic requirements (link between the capital and important industrial or

agricultural areas), partly as a reflection of the importance of international relationships (highways E5 and E15).

It was possible to divide highway No 1--according to traffic volume and the prevailing conditions at the end of the 1960s--into three major sections:

Budapest-Tatabanya: Here there was a modern road available, completed in 1960, expanded with non-grade-level railroad crossings and taken around inhabited areas over long distances.

Tatabanya-Győr: On this stretch several grade-level railroad crossings and long sections passing through built-up areas and/or substantial levels of local traffic hampered rapid traffic.

Győr-national border: The expansion of this section satisfied capacity requirements.

Accordingly, a study for the development of main highway No 1 was completed in 1966, which, on the basis of national traffic requirements and international importance, considered the construction of a superhighway along the entire route to be justified. Taking the requirements and the condition of the road into consideration, it was decided that initially the overloaded and accident-prone section Tatabanya-Győr had to be rebuilt. This would be followed by the section Budapest-Tatabanya and finally the section from Győr to the national border.

Construction on the section Tatabanya-Győr began in 1971 and it was opened to traffic in two phases: between Tatabanya and Komárom in 1975 and between Komárom and Győr in 1977. In the first phase of construction the decision was made in favor of a semi-superhighway, in the light of the expected speed of traffic requirements development and the economic resources of the nation.

One hundred and twenty kms/hour was established as the design speed. The road is routed across flat terrain, touching hilly areas only for short stretches.

Table 2. Characteristic Main Parameters of Superhighway M1 between Tatabanya and Győr

Design speed	kms/hour	120
Smallest horizontal radius	meters	3,000
Steepest grade	percent	1.4
Access points	units	4
Structures	units	34
Rest areas	units	4

The composition of the superhighway's pavement construction can be described briefly. Based on the experience gained during the construction and short operation of superhighway M7, because the construction machinery available at the time for the superhighway was needed elsewhere and based on the more economical form of construction calculated from the construction industry's

prices from that period, an asphalt pavement construction was adopted. An asphalt layer, with a total thickness of 18 cms, was applied to the cement stabilization layers over the earth base in four steps. For the first time the so-called "hot-rolled," that is to say, a roughened sand-asphalt wear layer following an English prescription, was used, because traffic safety can be improved by increasing the roughness, or the coefficient of resistance to slip. The top layer has fulfilled all expectations in this regard.

The highway commission built in the center of this stretch oversees all the work associated with maintenance and keeping the road open. Its most important functions are (as for all the superhighways):

- o to ensure that the highway is open:
  - traffic regulation and organization
  - information passed on to highway users
  - enforcing traffic safety
  - cleaning and winter service
  - maintaining its own operational installations
  - supervision of other organs

- o for maintenance
  - pavement surfaces
  - highway accessories and traffic signs
  - drainage installations and structures
  - care of plantings
  - operational installations, vehicles and machinery

In the second half of the 1970s the decision was also made in favor of the expansion of the Budapest-Tatabanya section. Since driving through the built-up area of Tatabanya was causing most of the problems on the existing road, the 22-km long stretch between Bicske and Tatabanya was expanded first and opened to traffic in 1982.

The development of traffic, including the volume of east-west truck transit traffic, the opening up of domestic industrial areas and the role of highway routing in the international highway network (part of E5, and also of the TEM and CEMA network) determined the expansion of the superhighway in a single construction phase with 2 X 2 lanes.

Table 3. Characteristic Main Parameters of Superhighway M1 between Bicske and Tatabanya

Design speed	kms/hour	120*
Smallest layout radius	meters	900
Smallest summit radius	meters	10,000
Smallest basin radius	meters	6,000
Steepest grade	percent	4

\* on four summits 100

Following the application of the requisite protective layers, which were different for each section, pavement construction was completed with the installation of a double-layer cement stabilization and of an asphalt layer totalling 22 cms in thickness. The top layer was designed to be the roughened sand-asphalt type, which has demonstrated so many positive features. The shoulders on stretches with more than a 3-percent grade have the same construction as the main pavement. In the case of the shoulder, only the top layer is different, the plans calling for fine asphalt concrete here.

In 1981 construction of the Budapest to Bicske section was started. It is expected to be open to traffic in 1986.

#### 4. Superhighway between Budapest and Gyöngyös

Superhighway M3 connects the capital with the important industrial, farming and tourist areas in the north-east of the country.

The construction of this 60-km-long section from Budapest is justified by the resurfacing that was carried out in 1970, the existing sections passing through built-up areas and the limits to the possibilities of expansion on the existing highway No 3.

Traffic prognoses showed that the construction of a superhighway in work steps involving 2 X 2 lanes is justified on the basis of the expected requirements of this collection area, which is also burdened with heavy freight traffic.

As with the other superhighways, the design was carried out in several phases. The initial plans were worked out in 1961, and starting in 1969 the approval and construction plans for the individual sections came out on a running basis. Aerial photogrammetry and EDP, which are still considered modern methods today, were used here. EDP programs were available to calculate the the layout and longitudinal section points of the superhighway axis and the plotting data. Modern electrooptical equipment was used for layout plotting.

Table 4. Characteristic Main Parameters of Superhighway M3

Design speed	kms/hour	120
Smallest horizontal radius	meters	750
Steepest grade	percent	4
Smallest summit radius	meters	20,000
Smallest basin radius	meters	10,000

The width of the lanes, of the median and of the shoulder is in agreement with the dimensions employed on superhighway M7 with a crown width of 28 meters.

For the first time on any superhighway, a slow lane was constructed which is functional on stretches with a grade of more than 3 percent particularly because of the trucks. It is characteristic of the terrain that construction of this additional lane was required over a distance of 8 kms.

In the area of the traffic lanes the pavement was constructed with a top layer of roughened sand-asphalt which had already proved its favorable characteristics on superhighway M7. The top layer of the shoulders is fine asphalt concrete. Along with the top layer, the plans called for a 22-cm thick asphalt layer, put down on top of a 20-cm thick cement stabilization layer, applied in four coats. Five access points were designed on the 60-km long section to provide a link with the larger localities and as connections to the main highway network. The distance between them is from 12 to 17 kms, as needed.

Traffic safety is helped by a light barrier set up on the median, which provides protection from being dazzled by the headlights of oncoming vehicles in curves with a smaller radius.

The superhighway was opened to traffic in the following phases:

Budapest-G8d811o	Kilometer 10 to 34	1978
G8d811o- Hatvan	Kilometer 35 to 55	1980
Hatvan-Gy8ng8s	Kilometer 56 to 71	1983

Operating and maintenance tasks are carried out by the highway commission built in the middle of this section. Its functions, facilities and methods are the same as those described for superhighways M1 and M7.

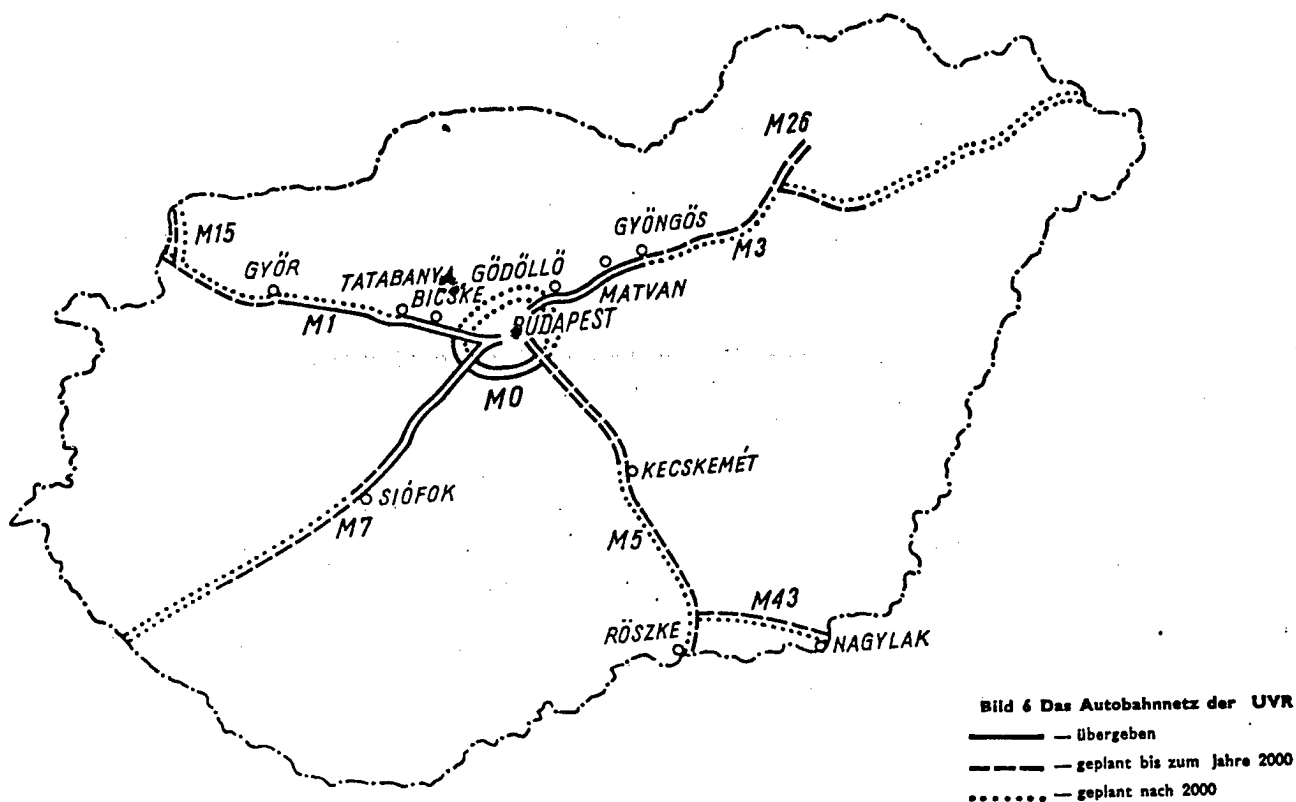
#### 5. Superhighway M5 between Budapest and Kecskemet

Superhighway M5--which will take the traffic from main highway No 5, which just recently reached its maximum capacity--is a part of European highway E5, forming an important stretch along the north-south transit network.

This highway opens up such important Hungarian industrial and agricultural areas as the cities of Kecskemet, Szeged and their environs.

In the first phase of construction as far as Kecskemet, M5 is being expanded on a cross sectional staggered schedule (currently no section is in operation). The traffic density pattern justifies the construction of a semi-superhighway in the near future, but widening to 2 X 2 lanes is planned with continuous further construction.

Using the test designs approval plans were worked out at the end of the 1970s. Today the final plans for the approximately 60-km long stretch are also complete. Construction work is under way on the first 40-km long subsection. The superhighway runs across flat terrain with direct routing, not using the minimal figures of the technical parameters that are part of the design speed of 120 kms/hour. There are four access points, pavement construction is built up of asphalt. The section now under construction is expected to be open to traffic as a semi-highway in 1985, when the expansion of the Budapest access stretch in the primary phase of construction will also be carried out.



## The Superhighway Network of the Hungarian People's Republic

### Key:

1. Open to traffic
2. Planned by the year 2000
3. Planned after the year 2000

### 6. Prospects for the Development of the Superhighway Network

The sections of superhighway already completed and currently under construction mirror the international and domestic flows of traffic in Hungary that show the greatest volume (industry and tourism). Because of the geographical situation of the country, the highway network is a radial system. Traffic is naturally heaviest on the stretches closer to the capital, and for this reason 70- to 120-kilometer long access stretches to Budapest were or are being built on all four superhighways (M1, M3, M4 and M7). The highways are linked to form a single network by the planned ring road M0 on the outskirts of Budapest. The most important section of this ring road will link highways M1 and M5 south of the city and carry international highway E5 (according to

the new numbering system E60 and E75) as a superhighway through Hungary. This section of superhighway M0 will free the Budapest urban area of through traffic. This is important primarily with respect to international truck traffic, so its expansion is a pressing matter.

Our further plans include the continuing expansion of superhighways M1 and M5 as far as the border (to Hegyeshalom or Rűszke). Expansion will most probably be carried in stages, initially as a semi-highway and then widening to 2 X 2 lanes. Superhighway links are planned from M1 into the CSSR (M15) and from M5 into the SRR.

The road designated as E71 according to the new numbering system is also important for international and domestic traffic. In this direction we intend to extend highway M7 as far as the Yugoslavian border and M3 in the direction of the Soviet Union.

With the exception of M3, the highways described are part of the north-south European superhighway network (TEM). Large-scale planning work is being carried out currently in Hungary to create a prospective superhighway and major highway network. In the investigations, consideration is being given to the data concerning the development of localities, of industry and agriculture, of tourism and the population, the prospects for international traffic and all factors that can influence the size of the highway network.

During the planning analytical traffic tests are being carried out using EDP. Effectivity and economy are also being examined or evaluated with the help of EDP programs. These tests cover 15 different points of view (costs of investment, fuel and time, energy consumption, environmental damage, etc.). The new highway development plan, which is to be ready by the end of 1984, will contain the detailed construction schedule for the already approved highways and those just described and, according to need, make proposals for the construction of additional superhighway sections in harmony with the development of the entire road network.

9581

CSO: 2300/213



## INADEQUATE FIRE PROTECTION MEASURES IN BUILDINGS

Bucharest PAZA CONTRA INCENDIILOR in Romanian Nov 83. pp 16-17

[Article by Eng Ionel Savu]

[Text] In accordance with the requirements of normative acts such as Law no/9 1980 (the Law on Investments), Law No 8/1977 ( the Law on Providing Durability, Safe Operation, Functionality and Quality of Constructions), Decree No 232/1974, republished, Decree No 290/1977, Decree No 400/1981 and Decree No 70/1975 as well as on the basis of specific standards for design and building of constructions and installations even during the phase of preparation of the investments, it is necessary to take firm measures to provide for the fire protection of the projects. In this regard an important role belongs both to the design organizations as well as investment's beneficiary units. There also is special importance for everyone working in design and building as well as the beneficiaries to possess a detailed knowledge of the specific standards for preventing and putting out fires, norms which must be applied in carrying out the particular investments.

From here we have the need for the ministries and other central organs, parallel with the activity of knowing their legal responsibilities and duties, to have the responsible factors provide good technical information for all those carrying out activities in the investment area. The information must refer both to the protection measures provided by normative acts and standards as well as to the results obtained following investigations made in the area of firefighting.

What also must be known are the new solutions used at the world level for providing safety for the projects, conclusions and lessons resulting from big fires in subordinate units as well as in similar projects in Romania or abroad. It goes without saying that under conditions of this documentation a competent and thorough analysis can be made of all the aspects connected with providing protection for the projects in case of fire.

Among the factors participating to a large extent in carrying out the future investments, an important role is played by the design organizations. We know that, in accordance with the requirements resulting from Decree No 290/1977 and other normative acts, the design organizations have the task of establishing fire protection measures specific to the projects designed, of foreseeing

methods for preventing and putting out fires as well as the composition and supply of the civilian firefighting formations. At the same time, they must draw up and attach to the building documents the diagrams and operating instructions and rules for maintenance of devices and fire protection installations in operation. We can say that the majority of the design institutes under the ministries and central organs as well as other design organizations belonging to the county people's councils and the industrial centrals are carrying out good activity in this regard, permanently being concerned with precise application of the norms' provisions.

It is well known that what is essential for appropriately carrying out a technical solution along the line of fire protection for an investment is having it established in time and under favorable operating conditions. Unfortunately, there also are situations where some designers, by failing to respect the provisions of the general standards approved by Decree No 290/1977, have not established solutions in the technical-economic documents they have worked out, which would satisfy all the requirements for safety or in some cases these solutions have been designed wrong.

The example we give in regard to this last aspect seems graphic. Recently a new construction was put into use in Tirgu Mures Municipality, one intended to house the warehouse for the wholesale trade enterprise for textiles and footwear. In conformity with the standards issued by the Ministry of Industrial Construction, the warehouse was provided with special sprinkler installations. Due to insufficient knowledge of the standards as well as due to the lack of a solid analysis of the solution adopted for the water pumping station in case of fire, the specialized designer provided for the fire pumps to be mounted in the pumping station without insuring that the minimum level of water from the tank was above the body of the pump, as provided in the specialized normative I.9/1983. In this situation, in case of an interruption in pump operation, since priming devices were not provided for, there is a considerable reduction in the supply of water needed to conform with the provisions in the standards, with negative consequences in case of an attempt to put out an eventual outbreak of fire.

As a result of insufficient knowledge of the standards, the Bucharest Decorative Enterprise, which designs and builds trap doors for gas and smoke exhaust from the stages of the big projects which have auditoriums, even now has not solved the problem of providing for automatic opening of these important protection systems to conform with the provisions of the standards. As a result, in case of need, since there is no special personnel for stepping in either, the particular trap doors cannot be put into operation fast enough, which can lead to a spread of the fire. Also of overwhelming importance in timely and quality fire protection, in accordance with the provisions in the standards and those in the technical-economic documents, are the measures established by the diagrams which the designer must draw up in accordance with the Law on Investments, diagrams in which--why should we not admit it--the inclusion of certain aspects which also aim at fire safety is treated with less attention.

In conformity with the provisions of Article 29 in the Law on Investments, the general designer, together with the central organs and beneficiary enterprises, as well as other factors participating in carrying out the investments, draws up a series of documents while working out the draft, among which also

is the diagram for the progress schedule of the investment. This must provide for phasing of C + M jobs, as well as for the installations which are conditions for fire protection, including in the period of technological testing, in close agreement with the length of building time and timetables for putting the projects designed into operation. Just as important is the diagram for delivery of equipment, a diagram by which the delivery schedules must be established for the machinery which will include the civilian firemen where they are needed, in conformity with the supply standards issued by ministries and the apparatuses and other equipment and fire protection means which must be supplied in correlation with the diagram for scheduling the progress of the investment.

With regard to the diagram for providing the work force for normal operation of the production capabilities it is necessary even as activity begins to provide for training of the personnel employed especially for jobs in the civilian firemen's formations in conformity with the provisions of Decree No 232/1974, particularly in the case of investment projects which are unique or very complex or very vulnerable to fires. Upon establishing the time lengths for training this category of personnel, along with the general aspects, account also must be taken of the particular features and characteristics of the technological processes and nature of the substances or raw materials, semi-manufactured or finished, so that when the testing begins this personnel has a very good knowledge of the projects and the technological installations and has at its disposal a rich amount of knowledge specific to the dangerous technologies in the particular unit, thus being able to take effective action at each job to prevent fires and, when needed, to step in with maximum effectiveness to put out any fires.

A review of the main shortcomings in timely implementation of the fire protection measures and in providing operation of the protective installations and devices at normal parameters would be incomplete if we did not also refer to the duties of the construction-assembly organizations which fulfill jobs of general contractor and specialty contractor as well as those of the investment beneficiaries.

Generally it is found that although both the Law on Investments as well as through Decrees Nos 290/1977 and 232/1974, republished, establish specific duties for these factors with regard to providing safety for the new investment projects, they are not always showing sufficient concern for carrying out the protection jobs provided by the standards or execution documents on a timely basis.

So the beneficiaries of investments in all cases have not kept in mind that the technical personnel for supervising construction of the projects should be solidly trained in knowledge of the technical design standards and building of the constructions and installations from the viewpoint of respecting the requirements for fire protection. At the same time, there is too little emphasis on their knowing and permanently following up on the stage of carrying out the protection measures in the technical-economic documents.

Many of the lags in building installations and devices for preventing and putting out fires also are due to the construction-assembly units, which do not

always collaborate with the designers in bringing up to date the investment progress schedules or so that building of the projects is done in strict conformity with their provisions. Also, there has not been precise respect for the technical solutions approved by the investment's technical-economic documents and in some cases poor quality jobs have been done, which then were necessary to redo, thus leading to delays and failures in carrying out good quality fire protection measures fast enough as well as to supplemental expenses.

For this reason, in many situations a number of projects have begun their activity without the fire protection systems' being totally built or being put into operation, thus insuring operation of the new investments under conditions of full safety.

Just as serious is the failure of builders to respect certain provisions in the technical standards such as, for example, in the case of some big energy or metallurgical industry projects being built where fire protection installations are not being built in constructions especially intended for electric cables which serve some big consumers, prior to laying of the cables in these locations, thus going against the provisions of the specific normative PE 107/1982. It goes without saying that under conditions in which a large number of electric cables are found in areas having quantities in the tons of material which are very dangerous for fires (PVC) in the structure of the outer protection cover, any negligence in carrying out the protection jobs can produce particularly large losses and long stoppages of production activity.

Also negative is the fact that due to the failure to build the protection systems on time for some investment projects with great crowds of people, they have been put into use without the fire safety measures being carried out completely, with the installations not in a perfect state of operation. At this time we also stress the totally inappropriate situation at the culture house for the trade unions in Slobozia Municipality, a project put into use some years ago, one for which even now the fire detectors and signal center have not been mounted so that a start of a fire cannot be signalled in time to have effective intervention.

With a view to providing sure fire protection for the investment projects, it is necessary for the responsible factors who have duties in this regard to intensify their efforts so that, parallel with shortening the timetables for putting the projects into use, application of new materials, construction elements and building technologies is sought permanently, ones which would satisfy the safety requirements provided in the normatives and standards in effect under better and better conditions.

8071

CSO: 2700/82

## STATUS OF MARITIME FLEET OUTLINED

Belgrade EKONOMSKA POLITIKA in Serbo-Croatian 28 Nov 83 pp 28-30

[Text] An alarming warning came in recently from "Jugolinija" in Rijeka to the effect that this year Yugoslavia will pay foreign shipping companies about \$500 million to carry 60 percent of our exports and imports. Frane Valentic, general director of this, our largest, maritime carrier, has declared that if this continues Yugoslavia will be without a merchant fleet by the year 1986, and that we will be paying foreign vessels \$1 billion a year. Other warnings are also coming in at the same time to the effect that our merchant fleet might be left without Yugoslavia.

Figures on how much Yugoslav work organizations pay every year for shipping to vessels under foreign flags cannot be precisely learned, nor proven, for the simple reason that summary records are not kept on this anywhere. But it is a fact that in recent years Yugoslav maritime carriers have been hindered in their development and have been finding it increasingly difficult to wage the fierce commercial battles with foreign maritime competitors. The international competition has become especially fierce since the general world recession some 10 years ago. Today approximately the same quantity of cargo is offered for maritime transport in the world as there was in 1974, but the capacity of the world merchant fleet has increased 36 percent in the meantime. Last year Yugoslav maritime carriers collected 40 percent less in shipping charges than in 1974.

Competition of shipping companies on the so-called "open register"--under Panamanian and Liberian flag--has been especially manifested throughout the world these past several years, and along with them merchant vessels from Greece have also been offering carriage at prices below the usual average.

For all these reasons it came about that our own shipping companies have for a number of years been carrying only 30-40 percent of Yugoslav exports and imports, more accurately, of that portion of imports and exports transported by sea. The larger remainder is carried by foreign vessels. In the last 4-5 years our visible trade going by sea (exports and imports) has averaged about 22 million tons, of which our own shipping companies have taken 7-8 million tons of cargo. Incidentally, the ships of the Yugoslav maritime shipping organizations also have an annual traffic of about 22 million tons of cargo, which means that they carry the remaining 14-15 million tons of cargo between foreign ports.

## Pattern of Development

We learned from a conversation with Jovo Ivovic, director of the Business Community of Yugoslav Maritime Shipping Companies, that the shipping companies, for all the shortage of cargo, are actually complaining much more about the impossibility of further development of the fleet, that is, of enlarging capacity. Ivovic says, however, that this only appears to be an absurdity, since, first, the desire is to modernize the fleet, and second, that it is assumed that there will be an economic recovery in the world at an early date and that world trade will pick up once again--to carry which it will be necessary to have a ready, equipped and capable fleet. The age of the Yugoslav Merchant Fleet is above-average by world standards and averages 16.7 years. Of the 263 vessels in international navigation, Yugoslavia has only 6 container vessels, 2 ro-ro container vessels, 8 ro-ro vessels, and 26 semicon-tainer vessels. These vessels represent what today is considered to be a fleet in line with up-to-date technology, the fleet with which it is possible to compete successfully on the international shipping market, but which has a share of 12.3 percent of the gross registered tonnage in our total capacity.

"How to develop" still remains, then, the most important question for the Yugoslav maritime shipping industry, and the helplessness of those who have sought an answer to this question was especially evident at the beginning of this medium-term planning period. That is, since 1980 the fleet has been shrinking even in physical terms. In 1922 Yugoslavia was in 18th place in the world merchant marine, but today it is in 26th place.

At the beginning of this year Jugoregistar [Yugoslav Register of Shipping] had on record a total of 475 of our vessels, with more than 100 gross registered tons. The major portion belongs to the Community of Yugoslav Maritime Shipping Companies--16 shipping organizations from 4 republics (Croatia, Slovenia, Montenegro and Serbia), with 327 vessels. That is, all Yugoslav maritime ships engaged in international transport of cargo and passengers (263 vessels) belong to the community.

### Community of Yugoslav Maritime Shipping Companies

<u>Indicator</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
Vessels	296	318	339	332	327
Gross registered tonnage (in mil-lions)	1.45	1.90	2.46	2.46	2.45

When a shipping company purchases vessels or has them built it is customary world practice to provide credit in the amount of about 80 percent of the value of new construction, at an interest rate of 8 percent, for a period of 8.5 years, which is calculated to be the average amortization period for a vessel (the example of the OECD countries). In some places these credits are given for a longer period of time and with a grace period of several years. Those were also the terms of conditions which domestic shipyards offered to domestic shipping companies in our own country when the General Investment Fund was in operation, and that continued to be the case up until about 1975.

In the period 1975-1980 the terms and conditions for building ships for domestic customers were already deteriorating, but the "Piran Agreement," whereby the problems of shipyards and shipping companies were simultaneously resolved in Croatia, offered a partial way out. Finally, since 1980 it is under these terms and conditions that ships have mainly been built in domestic shipyards for foreign customers, while as a practical matter there have been no conditions whatsoever for development and fulfillment of the plan for the growth of Yugoslav maritime shipping organizations, taken as a whole. Once again, only in Croatia have some funds been furnished for the credit financing of Croatian shipping companies, but even that was half what was envisaged by the plan covering the period 1980-1985.

Volume of Cargo in International Transport of Yugoslav Maritime Shipping Companies, in thousands of tons

<u>Indicator</u>	<u>1968</u>	<u>1969</u>	<u>1973</u>	<u>1974</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
Total	9,715	14,136	14,671	16,921	21,049	22,365	23,744	21,923
Exports	1,021	941	850	1,067	1,172	1,248	1,221	1,334
Imports	2,203	2,788	1,497	2,483	4,975	6,391	6,860	6,322
Transit	843	660	517	442	715	891	663	562
Between foreign ports	5,648	9,747	11,807	12,929	14,187	13,835	15,000	13,705

Source: Ivovic, Jovo, "Statistics on Development of Yugoslavia's Maritime and River Shipping Industries for the Period From 1968 to 1982."

And the plan envisaged that over those 5 years the capacity of the Yugoslav Merchant Fleet would increase from 2.46 to 3.2 million gross registered tons, accompanied by current scrapping of old vessels and new construction of modern ones.

The domestic customer for domestic vessels was by social agreement in our country referred to the relevant self-management accord of the Association of Yugoslav Banks. The association of banks, however, provided for the development of maritime shipping in this medium-term plan 1 billion dinars, which is enough for a down payment to build one vessel on credit (the average vessel costs 2 to 3 billion dinars). Domestic shipping companies do not have capital of their own to purchase vessels, so as a practical matter there are no conditions whatsoever for achieving the desired capacity of 3.2 million gross registered tons. And that will mean continued troubles for our merchant marine and will eliminate the conditions required for a start in performing the tasks of transportation policy as denoted by the Commission of Federal Social Councils for the Problems of Economic Stabilization. That is, the documents of the commission stated among other things that the most important tasks in the sector of maritime transportation are the following:

- i. considerably faster growth of the total capacity of our merchant fleet, so that toward the end of this decade it would reach about 5-6 million gross registered tons;

- ii. introduction of new technology and application of technical innovations in the building of ships, as well as an increase in vessel capacity;
- iii. change in the composition of total transport capacity through an increase in the share of tankers and vessels for carrying bulk cargo;
- iv. equipping our merchant marine and principal seaports for large-container traffic;
- v. construction of passenger vessels which will contribute to development of tourism on our coast and islands.

On this occasion special solutions were once again sought in Croatia--whose capacity constitutes 60-70 percent of Yugoslavia's merchant fleet, and last September a self-management accord was adopted at the level of the republic's grouping of shipbuilding and shipping to furnish about 20 billion dinars, that is, funds for construction of about 20 vessels. Contracts have already been let for building some 15 vessels, but all 20 would be slightly more than half of those planned for this medium-term period in Croatia. The shipping companies have a share of 20 percent of the funds covered by those arrangements.

As for the others, "Splosna Plovba" of Piran and "Beogradska Plovidba" of Belgrade are each building one vessel, and it is most likely that with reduced scrapping of old vessels, Yugoslavia's maritime merchant fleet will at the end of this planning period have approximately the same capacity it had at the beginning of this year.

#### Optimality and Partiality

At this point one question in geography and several in economics arise. The first is whether Yugoslavia is a maritime country or are only certain of its republics maritime republics? The others have to do with investigating the interests of domestic users of maritime transport in development of a domestic maritime merchant fleet. For example, why is it better for one of our business firms in the continental part of the country to pay more expensive shipping charges to our own vessel and at the same time set aside funds for the credit financing of the domestic shipping company than to pay cheaper shipping charges to some foreign shipowner? Jovo Iovic gave a number of reasons for this, some of which are patriotic and others economic in nature. The gist of it is that domestic shipping companies have shaped the bulk of their fleet according to the needs, business and plans of domestic users; that it is in line with those needs that they have established regular lines to other parts of the world; that domestic vessels are always ready to adapt to exceptional situations and difficulties of the domestic user; that without exceptions they have also undertaken to carry domestic noncommercial cargo; that up until this year domestic users paid shipping charges to our shipping companies in dinars, and even now that is the case of a goodly portion of services.... In addition, he also referred to the world calculation to the effect that it is 3-4-fold more economically efficient to sell the services of a vessel than to sell the vessel, and that also applies to the Yugoslav



national economy. In light of all that, the operation of a vessel brings (and saves) the entire country urgently needed foreign exchange.

An optimum national economy, however, also presupposes an optimum national economic policy--which, just as it is lacking for other sectors, is also lacking for development of maritime transportation, so that instead of an optimum policy, we have a partial policy. But even that partial regional policy, it seems, still did not sufficiently consult present and potential users of maritime shipping, since it is obvious that the mutual interests of shipping companies and shippers are considerably greater than shown by 1 billion dinars pooled by the banks. For instance, it is evident from a survey of shipping charges paid to maritime shipping organizations that the largest users of their services have been organizations of associated labor in Serbia proper. That is, of the \$287 million included in the statement for last year (all paid in dinars) users from Serbia proper paid \$102 million, those from Croatia \$71 million, from Slovenia \$56 million, from Bosnia-Herzegovina \$39 million, from Vojvodina \$9 million, from Macedonia slightly less than \$6 million, from Montenegro about \$3 million, and from Kosovo about \$1 million.

#### Against Our Own Development

On the other hand overall national policy seems to have done everything it could to make the position of the shipping companies more difficult. This is best seen in domestic shipyards, where construction for foreign customers has numerous benefits: the ship is financed with credit through the Yugoslav Bank for Foreign Trade under the terms and conditions that prevail in the OECD countries, imported parts and equipment are entirely or partially free of duty, and the vessel as a whole is considerably cheaper than it would be for the domestic customer--who does not have all those benefits. It has already been shown that vessels financed and built in this way have been paid off after 4-5 years, after which they realized profit along with our national income (until final payment of the credit). For two decades now our shipping companies have requested that the resources of the banks earmarked for stimulating exports be committed in part to domestic organizations of associated labor in the shipping industry and shipbuilding for domestic needs. As Ivo-  
vic put it, the domestic shipyards would also be glad to build ships for Yugoslav maritime shipping organizations--under the same terms and conditions they provide to foreigners, but the regulations embodying this system do not allow this. The countries of western Europe, Japan, Brazil, South Korea, China, the USSR and our other maritime competitors are building as much as 90 percent of the vessels for their domestic needs. In the shipyards of Yugoslavia, which in terms of output occupy approximately 10th place in the world, on the average about 7 percent of output is intended for domestic shipping companies, and there have even been several years at a time when not a single vessel was built for the domestic flag.

Economic difficulties in Yugoslavia, together with the increasingly entangled regulations (dis)embodying the system, have brought a number of additional difficulties on Yugoslav shipping companies. In spite of the foreign exchange which they earn, they have been perpetually illiquid with respect to foreign exchange, and more and more frequently they are laughed at stock

throughout the world, seeking to charge fuel and other maritime or port services. The creditors are already holding our vessels in the seaports of the world, demanding collection of debts. All of this is causing new costs and losses, and it is diminishing the reputation of our shipping organizations.

Until last year domestic users paid domestic vessels exclusively in dinars. This has now been changed by the new regulations, but the entire relation has been so "fortunately" formulated that no one can know precisely how and when the shipping charges are paid. That is, the regulations state that in the case of imports the domestic user will pay the domestic carrier a certain percentage of the shipping charge in foreign exchange--depending on the actual shipping costs on the international route, which for shipping ranges from 50 to 70 percent. In the case of exports, however, the domestic user is to "transfer" to the shipping company foreign exchange for shipping--according to the inflow of foreign exchange which is realized. This can be interpreted in the most differing ways--if, say, the goods are sold on credit, and the inflow of foreign exchange is realized only after several years, or if the goods are delivered on the basis of some compensation arrangement, or if the goods are being sent as a gift (Red Cross packages and the like), then there is no inflow of foreign exchange....

Finally, there are also numerous joint or republic regulations pertaining to the vessel itself and its business operation which makes things more difficult here. For instance, our vessel is required to have in reserve about 50 percent of its crew, while this reserve is about 25 percent for our competitors, which is certainly considerably cheaper. Nor are Yugoslav shipping organizations outside the system even with respect to the cumbersome and complicated "self-management" administration.

Because of all the circumstances we have enumerated which make development and business operation more difficult, the shipping companies are afraid and angry when they are called upon to offer the same conditions for shipping services as the foreign merchant fleet. Which was asked of them in the decision on Yugoslavia's joint foreign exchange policy for 1983 and in the order setting forth the long-range program for regulating exports and imports of services over the period 1982-1985. The people at "Jugolinija" say that asking the Yugoslav vessel to carry at the same price as a foreign shipping company is the same as allowing goods to be imported on the Yugoslav market without protective instruments and import charges, and that that kind of liberalism is not encountered in any other business sector.

Nevertheless, it is clear that the only way out and the only solution for Yugoslav maritime shipping is precisely to find a way of becoming competitive to the foreign fleet. This condition will also be imposed on all our other business sectors sooner or later.

But unless equal terms and conditions are guaranteed both in the construction and also in the operation of the vessel, there will be no such competitiveness. And by that very fact it will not be in the interest of the user to commit his capital--directly or through banking channels--to strengthening the domestic fleet. After all, unequal shipping conditions also make them less competitive on the world market.

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from JFRS 84965 of 16 December 1983  
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copies of the report.

YUGOSLAVIA

#### MACEDONIAN POWER PROBLEMS, RESTRICTIONS REPORTED

AU010939 Belgrade BORBA in Serbo-Croatian 25 Nov 83 p 4

[S.P. report] Skopje, 24 Nov--The total daily production of Macedonian power plants is between 10 and 11 million kilowatts, which is less than half of what Macedonia needs. The daily consumption is about 17 million kilowatt-hours and the difference is made up from other producers in the country and from imports.

The Association of Power Generation Industry of Serbia delivers about 10 megawatts to Macedonia, Kosovo provides 110 megawatts for the Skopje steelworks, and the Soviet Union delivers twice a night 68 megawatts. Macedonia receives some electric power also from Slovenia, mostly during the night.

At the moment, general consumption has been reduced 20 percent and major consumers receive 30-50 percent less than they need, which does not mean that power is being saved equally everywhere. The Jugohrom combine consumed 1,408,000 kilowatts yesterday instead of the 990,000 kilowatts allowed and thus considerably reduced the power supply in the republic, which is meager anyway. There are towns in Macedonia, such as Titov Veles, which so far have not learned what restrictions are. It seems that Skopje is the only town in the republic which has regular restrictions in power consumption.

Power is still being generated from reservoirs, although the critical water level has been passed. At the moment, they are a potential source of about 32 million kilowatt-hours of electric power, which is nevertheless more than in the same time last year.

Heavy oil for the second generating unit of the Negotino thermoelectric power plant is supposed to be provided, and the moment it arrives all Macedonian power plants will reduce production and save power for new crises. And it seems that a new crisis is imminent. This was announced at the session of the Self-Managing Interest Community for Energy which was held today and at which it was said that the fifth degree of reduction will be introduced soon if the heavy oil is not found.

CSO: 2800/102

END